DOCUMENT RESUME

ED 208 347 HA 014 098

AUTHOR Milner, Margaret
TITLE Adapting Historic Campus Structures for Accessibility.
INSTITUTION Association of Physical Plant Administrators of Universities and Colleges, Washington, D.C.; National Center for a Barrier Free Environment, Washington, D.C.
SPONS AGENCY American Council on Education, Washington, D.C.; Department of Health, Education, and Welfare, Washington, D.C.
PUB DATE 80
CONTRACT 300-78-0288
NOTE 98p.; For a related document, see ED 175 080.
AVAILABLE FROM Publications Service Dept., APPA of Universities and Colleges, 11 Dupont Circle, Suite 250, Washington, DC 20036. ($5.30); Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402 (Stock No. 065-0001-00034-2; $4.25).

EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS *Accessibility (for Disabled); Architectural Character; Building Plans; College Buildings; *Educational Facilities Improvement; *Facility Case Studies; *Facility Guidelines; *Facility Requirements; Federal Legislation; Federal Regulation; Higher Education; Interior Space; Laws; Physical Disabilities; *Preservation
IDENTIFIERS Historical Landmarks; Rehabilitation Act 1973 (Section 504)

ABSTRACT

The issues involved in making accessibility modifications to buildings of historic value, architectural significance, or traditional interest are reviewed in this publication. A related document, ED 175 080, "Creating an Accessible Campus," contains information and design recommendations applicable to all buildings. The first part of the document discusses the characteristics of older buildings; reviews some of the access needs of handicapped persons; notes laws and policies governing preservation and access; and provides information on what progress has been made toward accessibility in older campus buildings. Projects presented in the second part are from six schools of architecture selected to develop design studies. Teams of architecture students developed design recommendations to achieve accessibility in an older campus building. A Technical Study Group reviewed the design solutions and suggested alternatives where appropriate. The appendices contain a list of state historic preservation officers, the California State Historical Building Code, the U.S. Department of Health, Education, and Welfare's Section 504 Regulations and Analysis Concerning Existing Facilities, a list of campuses reporting accessibility projects in older buildings, a bibliography, and an index. (Author/MLF)

Adapting Historic Campus Structures for Accessibility

ED208547

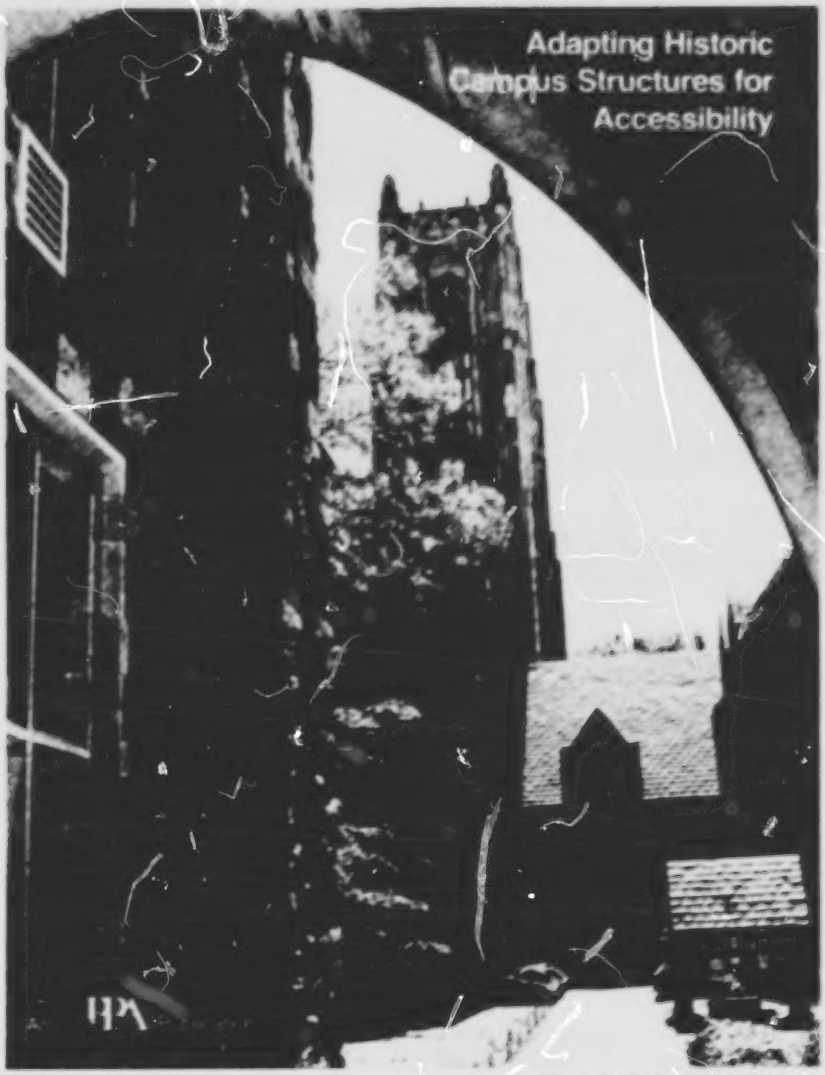
SCOPE OF INTEREST NOTICE
The ERIC Facility has assigned this document for processing to: EA HE
In our judgement, this document is also of interest to the clearinghouses noted to the right. Indexing should reflect their special points of view.

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
✓ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

EA 014 098

Adapting Historic Campus Structures for Accessibility

by Margaret Milner



Cover art courtesy of Southeastern at Memphis

Association of Physical Plant Administrators
of Universities and Colleges

National Center for
A Barrier Free Environment

This publication was prepared as an account of work sponsored by the Association of Physical Plant Administrators of Universities and Colleges (APPA) and the National Center for a Barrier Free Environment (NCBFE), 1140 Connecticut Avenue, N.W., Suite 1000, Washington, D.C. 20036

This project has been funded in part with Federal funds from the Department of Health, Education & Welfare (DHEW) under contract #300-78-0288 with the American Council on Education (ACE). The contents of this publication do not necessarily reflect the views or policies of DHEW or ACE, nor does mention of trade names, commercial products or organizations imply endorsement by the U.S. government.

No APPA or NCBFE employee, member, consultant or author whose work is contained herein makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe upon privately owned rights.

Printed in the United States of America

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402

Preface

This publication reviews the issues involved in making accessibility modifications to buildings of historic value, architectural significance or traditional interest. Its recommendations apply to all older buildings, not only those considered "historic." The goal of this publication is to stimulate ideas for possible solutions to architectural barriers to handicapped persons in older campus buildings.

The Department of Health, Education and Welfare's regulations for implementing Section 504 of the Rehabilitation Act of 1973 require that, by June 1980, recipients of federal funds complete structural modifications required to make federally assisted programs fully accessible. Campuses have found that it is significantly more expensive to modify older buildings, especially historic structures. Unique issues and problems need to be addressed when modifying such buildings.

Creating an Accessible Campus, published by the Association of Physical Plant Administrators of Universities and Colleges (APPA) in 1978, contains information and design recommendations applicable to all buildings. It should be used as a basic reference in conjunction with *Adapting Historic Campus Structures for Accessibility*.

Two major activities contributed to the development of this publication. One activity involved work by students in six schools of architecture; the other involved a survey of members of APPA and of the Council for the Advancement and Support of Education (CASE) to ascertain what progress campuses have made toward accessibility in older campus buildings.

On the basis of historic interest and design challenge present in their campus buildings, six schools of architecture were selected to develop design studies for this project. The schools represent various geographical locations and types of institutions.

Teams of architecture students surveyed older campus buildings to identify accessibility problems and developed design recommendations to achieve accessibility in the building that presented the most interesting design challenge. They documented problem areas with photographs and drawings and proposed solutions to the problems. A Technical Study Group reviewed and critiqued the design solutions and suggested alternatives as appropriate. These projects are presented in Part Two of this publication.

The student design projects are a rich source of ideas and illustrate that a wide variety of approaches can be taken in the effort to make older buildings accessible. Each project proposes total accessibility for the building, not just program accessibility.

The survey of CASE and APPA members provided information on solutions to problems which campuses have implemented to make old buildings accessible to handicapped persons. The responses to this survey can be found in Chapters 4 and 5.

Many solutions can be developed to address a specific problem. The solutions highlighted in this publication may not apply to a specific building; however, they can be helpful in generating ideas for innovative solutions to unique problems found in older campus buildings. The Index will assist readers in finding solutions to specific architectural barriers.

This project was implemented by APPA and the National Center for a Barrier Free Environment (NCBFE). These organizations would like to thank the Office for Civil Rights and the Bureau of Higher and Continuing Education, Department of Health, Education and Welfare, for providing the grant which made this publication possible. APPA and NCBFE also want to thank the persons in the new Department of Education's Office for Civil Rights who have assisted in the completion of this publication and project.

Contents

		Page
Preface		iii
Foreword		vii
Acknowledgements		ix
Part I	Adapting Historic Campus Structures For Accessibility	1
Chapter 1	Preserving the Past for a Useful Future	2
Chapter 2	Designing Buildings for All People	6
Chapter 3	Laws and Policies Governing Preservation and Access	9
Chapter 4	Barriers by Tradition	13
Chapter 5	Developing Access to Older Buildings	15
Part II	Creating New Approaches to Access: Six Design Studies	33
Design Study 1	Developing Access to a Physical Education Facility: Clemson University	37
Design Study 2	Planning Accessible Office and Classroom Spaces: Iowa State University	45
Design Study 3	Accessibility Recommendations for a Classroom Facility: Kansas State University	50
Design Study 4	Adapting a Building for New Uses: University of California, Berkeley	54
Design Study 5	Solving Accessibility Problems in Old Main: University of Colorado	61
Design Study 6	Modifying Theatre and Student Union Facilities: University of Notre Dame	67
Appendices		
Appendix A	State Historic Preservation Officers	78
Appendix B	California State Historical Building Code	80
Appendix C	Section 504 Regulations and Analysis Concerning Existing Facilities, Department of Health, Education and Welfare	83
Appendix D	Campuses Reporting Accessibility Projects in Older Buildings	87
Bibliography		89
Index		90

Foreword

"The use of the past in the United States has always been turned toward the interests of the future, toward a bias of utility."

— Robin W. Winks, "Conservation in America," *The Future of the Past: Attitudes To Conservation, 1174-1974*

It is easy to love old buildings, and understandable that those who treasure them may resist the idea of making any changes to the graceful structures whose designers and craftsmen will never return. But we must value people as much as buildings; and buildings, if they are to continue in a useful capacity in today's world, must be usable by all — able-bodied, aged, temporarily and permanently handicapped persons.

Man is an adaptable creature. Most persons who are handicapped as a result of illness, accident or congenital condition are capable of participating actively in society. However, they are faced with adapting to situations imposed by an environment designed for able-bodied people. Attention must be directed toward adapting the environment so that it does not present additional barriers to people who have sustained some loss in physical capabilities.

The environment that was designed for the mythical average person imposes certain constraints on every user who varies from that norm. In the case of users with physical disabilities, the limitations imposed by the design may in effect become a handicap, preventing access to and use of the facility. The people affected by these situations are referred to as "handicapped persons" throughout this publication, meaning disabled persons confronted by environmental barriers.

An accessible environment accommodates users with a wide range of physical characteristics and capabilities. It is an environment that adapts to the actual needs of all people. It does so by recognizing a broad variation of extremes and caters to them with one design solution usable by all, to the maximum extent feasible. In fact, accessible features frequently turn out to be convenience and safety features that are welcomed by all people.

On the campus two important design constraints in modifying existing buildings converge: concern for preserving historic buildings and the need to make campus facilities accessible to all. Although these issues may seem to conflict, many colleges and universities have constructed solutions to these problems that prove that the architectural heritage can be maintained while making buildings accessible to all people. The same kind of creativity that brought historic buildings into existence can be channeled into designing accessibility modifications that are compatible with historic structures worthy of preservation.

By using this creativity, campuses can bring cherished buildings of the past into the present — and the future.

Acknowledgements

Advisory Committee:

Representatives of the Association of Physical Plant Administrators of Universities and Colleges (APPA)

William Campbell, *Chairman*
Director of Physical Plant
Johns Hopkins University

John McFadden
Director of Facilities Management
Iona College

Bergen Merrill
Director, Physical Plant and Planning
Memphis State University

Representatives of the National Center for a Barrier Free Environment (NCBFE)

Jay Jorgensen
Superintendent of Development
Fairfax County Park Authority

Edmond Leonard
Program Director
President's Committee on Employment of the Handicapped

Representative of the Association of University Architects

Allen L. Wiechert, AIA
University Director of Facilities Planning
The University of Kansas

Representative of School of Architecture

J. Norwood Bosserman, FAIA
Dean, School of Architecture
University of Virginia

Technical Study Group

Theodore T. Bartley, Jr., AIA
Bartley, Long, Mirenda

Stephen Cotler, RA
President
Accessible Design Consultants

Charles Parrott
Historical Architect
Heritage Conservation and Recreation Service
U. S. Department of the Interior

Author and Technical Advisor

Margaret Milner
Principal
Research and Editorial Services

Project Management Staff:

APPA Project Administrator and Editor

Maggie Coons
Special Programs Manager
APPA

NCBFE Project Administrator

John W. Armstrong
Executive Director
NCBFE

Staff Assistant

Lena Cunningham
Administrative Secretary
APPA

Readers Panel

Central States Region

George C. Money
Director of Facilities Planning & Capital Construction
University of Nebraska Medical Center

Eastern Region

Richard Keller
Counselor to Handicapped Students
University of Hartford

Midwest Region

James Shearer
Plant Services Department
University of Minnesota, Duluth Campus

and

Clinton Hewitt
Assistant Vice President, Physical Planning
University of Minnesota

Pacific Coast Region

John A. Burnett
Construction and Plant Operations Engineer
University of California System Administration

Rocky Mountain Region

Dick Hedman
Director of Physical Plant
Eastern Montana College

Southeastern Region

Glen Boxley
Director of Physical Plant
Morehead State University

NCBFE Representatives

Bruce Judd, AIA
Barrier Free Architects

Hugh Miller, AIA
Senior Historical Architect
National Park Service

Edward C. Plyer, ASID
Edward C. Plyer Associates

National Trust for Historic Preservation Representatives

Russell Keune
Senior Vice President, Preservation Services

Susan Lutzker
Associate Chief Counsel

Theodore A. Sande
Vice President for Historic Properties

Special appreciation is extended to the following people:

Charles W. Butler
Director of Physical Plant Division
University of South Florida
APPA President, 1979-80

Richard W. Anderson, Jr.
Group Vice President
Flack & Kurtz, Inc.
(former APPA Director of Special Programs)

Jim Bennett
Special Advisor on Section 504
Office of Program Review and Assistance
HEW, Office for Civil Rights

Rudy Frank
Acting Division Director for External Technical Assistance Division
Department of Education, Office for Civil Rights

Walter Healey
Special Assistant to the Acting Deputy Assistant Secretary for Program Review and Assistance
Department of Education, Office for Civil Rights

Paul Knapp
Executive Director
APPA

Martha Redden
HEATH Project Administrator

Richard Rowe
Director, Division of Training and Facilities
HEW, Bureau of Higher and Continuing Education

PART 1

Adapting Historic Campus Structures For Accessibility

1

CHAPTER 1

Preserving the Past for a Useful Future

2

By tradition, the academic campus has been a conservator of cultural achievements, building on its heritage to enrich the present and improve the future. In a world where change is rapid and constant, buildings from the past often serve as important links to this heritage. On college and university campuses, this function assumes even greater significance. The traditions that flavor the character of the campus are frequently embodied in the original buildings around which the modern campus grew.

Some of these structures possess aesthetic merit on the basis of their architectural significance, either because of the quality of their design or because they serve as examples of a renowned designer's work. Others may be valuable because they manifest local styles or use of native materials, represent a significant era in the development of the campus or community, or are associated with noteworthy individuals or events. Still other buildings may have sentimental or emotional value as a result of their association with campus traditions. Regardless of the reason for their significance, older buildings represent a tangible tie with the historic foundations upon which any college builds its present and future programs.

These older buildings may vary from small wooden structures to impressive and imposing marble edifices. Their historic significance may range from being associated with towering intellectual figures of national renown to having served as the first classrooms for a frontier institution. Yet most of these buildings will share one common characteristic. The majority will be inaccessible to handicapped students, staff and faculty.

Progress on Two Fronts

Concerns for developing accessibility while preserving the historic character of buildings have assumed increasing importance and public support during the past decade. The growing appreciation for outstanding older buildings and efforts to preserve and adapt them to new uses have resulted from a combination of factors: heightened public awareness of historic traditions, contrasts with contemporary architectural styles, and recognition of the scenic usefulness of older buildings that provide scale and contrast in the landscape.

In addition, economic factors create a bias in favor of extending the useful life of a building rather than replacing it with new construction.

Interest in conserving older buildings and the movement to make the built environment accessible to handicapped individuals have gathered momentum virtually simultaneously. This issue has come into focus for colleges and universities as they have initiated programs to comply with Section 504 of the Rehabilitation Act of 1973. While capital budget constraints and the spiraling cost of new construction have combined to make attractive the continuing use of older buildings, institutions are confronted with the requirement to assure that handicapped individuals have equal access to programs and employment.

Other recent legislation — notably Public Law 94-142, the Education for All Handicapped Children Act — assures handicapped Americans the opportunity to develop their full potential through education. Public schools, mainstreaming handicapped students, will graduate greater numbers eager for higher education in the years ahead.

Campuses sometimes encounter unique problems in removing barriers in older buildings, and the goals of preservation and accessibility may conflict. However, both goals almost always can be satisfied with modifications that respect the architectural fabric and style of the building while providing access and usability for handicapped people. Many campuses have already demonstrated this.

Some institutions have achieved the program accessibility mandated by the Department of Health, Education and Welfare's (HEW's) Section 504 regulations without finding it necessary to make historic buildings accessible, while other schools have delayed plans for alterations because of the problems anticipated. Many campus planners and architects have hesitated to embark on accessibility projects in older buildings, expecting the barriers encountered to be both more difficult and more expensive to correct than in modern structures. In fact, modification of the buildings may not be strictly required for access to academic programs. However, their symbolic importance to the institution strongly suggests that they should be made available to all persons. Unless handicapped individuals have access to these buildings, they will be denied a significant part of the campus experience.

The Evolving Campus and Its Students

The older buildings preserved and used by institutions of higher education reflect the continuity of the school over the span of changing times, as academic programs have grown and evolved in response to society's needs. In the course of the development of new academic programs, those buildings that have continued in use have often been adapted to new functions. Alterations have been made or the buildings have been expanded to accommodate a growing institution. A functioning building rarely survives the passage of time without some change to structure or internal systems.

At the same time that academic programs and buildings have evolved, campus populations have also changed. Today a typical American campus will include individu-

Buildings of different periods bring variety, vitality and scale to the landscape.

Old Main, Findlay College, Ohio
. . . one Victorian structure . . .

3

. . . and another
Markey Hall, California College of Arts and Crafts

als from a variety of backgrounds and with a wide range in ages; among them will be a number who have disabling conditions.

Some attempts have been made to classify the numbers of severely handicapped individuals in the United States. The following table is one estimate of the persons having severe disabilities.

Under age 18	180,000
18 through 64	4,200,000
65 and over	3,900,000
Institutional population	1,787,000
Total U.S. population with most severe handicaps	10,067,000

In the past, fewer individuals survived the chronic conditions, diseases or accidents that can cause disabilities, and those who did were often restricted to relatively quiet lives within their homes or in institutions. Today children with birth defects are more likely to grow to adulthood. Persons involved in accidents are saved, but may face severe disabilities. As a result, society now faces the urgent need to address the problem of allowing freedom of mobility for an increasing number of persons with disabilities.

Handicapped persons have become more vocal in demanding their rights. Their efforts are influenced by the advancement of civil rights causes in general, as well as society's growing tolerance for differing life styles and a greater understanding of individuals who may vary from generally accepted norms.

The handicapped child growing up in this decade benefits from parents who insist on that child's right to share fully in the resources of the community and to prepare to function as an independent adult. Disabled veterans, persons injured in automobile or motorcycle accidents, and others who have sustained traumatic injury will continue to expect to be productive citizens and enjoy community resources. The progress of the past reinforces the commitment of each new generation as it comes of age.

An additional factor that may influence the size of the handicapped population on campuses is the relatively recent phenomenon of senior citizens seeking educational experiences. Among these older citizens returning to the campus in their retirement will be many who face the physical limitations that accompany aging. Current estimates suggest that as many as 43 percent of persons over the age of 65 experience disabling conditions.

Finally, requirements to maintain nondiscriminatory hiring practices and affirmative action employment programs will result in larger number of handicapped staff and faculty members. The handicapped population on campus, growing steadily for the past twenty years, is destined to expand at an accelerated pace in the next decade.

As is often the case, colleges and universities are among the first of society's institutions to feel the impact of change. The pressures will increase, both as a function of the absolute size of the handicapped population and of the growth in proportionate demand within that population.

4

Restoration of campus landmark buildings is a growing practice. Syracuse University's Hall of Languages, the oldest building on campus, underwent an exterior restoration and an interior renovation. In the process, the building was made fully accessible. A new glassed-in "greenhouse" entryway (bottom right) allows access to the lower level and an elevator inside.

Thus as colleges and universities move into the 1980s, the issue of providing fuller accessibility for handicapped students, staff and faculty will continue to be an important factor in campus planning. Many campuses have achieved accessibility in high-priority areas during the past few years. Now, campus administrators and planners need to direct their attention toward making older structures usable by all. Therefore, various factors are influencing a move toward adapting older buildings for new uses rather than undertaking new construction.

These accessibility accommodations should be viewed in the context of the life span of the building. As the buildings have evolved over time, they have been adapted to maintain their usefulness. In the continuing evolution of the campus, removal of barriers is one more phase of an ongoing process.

Conservation, Preservation and Adaptation

As John Harvey noted in *Conservation of Buildings*, given that a building was initially well built and has been reasonably well maintained, "the economic balance will always be in favor of conservation." Harvey points out that the mathematical theory of strength of materials was not developed until modern times, and systematic application of the theory is relatively recent. The result is that

many older buildings are considerably stronger than necessary, with a factor of safety far greater than that required by modern building regulations. Sometimes, they are also better insulated and provide better protection against noise and vibration. Booz, Allen & Hamilton, in a study for the Advisory Council on Historic Preservation released in May, 1979, found that it takes more energy to construct a new building than to rehabilitate an old one. Other studies have indicated that recycling may cost 25 percent less than new construction. Finally, for colleges and universities, existing buildings represent an enormous capital investment. Their continued use is a dividend that institutions cannot afford to forego.

Preservation, strictly used, implies "the static maintenance of an object in unaltered condition," according to Harvey. Conservation, he suggests, refers to the maintenance and adaptation of the building in order to extend its utility.

A more flexible approach in terms of fitting old structures to new uses is the concept commonly referred to as adaptive use. Based on the theory of the building as an evolving structure, adaptive use generally implies the identification of historically or architecturally significant elements of a structure and the attempt to retain these elements to the greatest extent possible. Changes necessary for the new use are then made, and the architecturally significant elements are incorporated as an integral part of the design.

Ralph W. Miner, in *Conservation of Historic and Cultural Resources*, has expressed this concept in different terms: purity and continuity. Purity designates a restoration that has been done in an exacting manner to known, or assumed, details to represent the purity of an existing style. Continuity, on the other hand, retains additions and alterations reflecting the continuum of the building over a period of time.

These concepts closely parallel the definitions established by the Secretary of the Interior for historic preservation project treatments that may be undertaken on historic properties listed on the National Register of Historic Places. As published in "Standards for Historic Preservation Projects," these definitions cover acquisition, protection, stabilization and reconstruction as well as the following terms:

- *Preservation* is defined as the act or process of applying measures to sustain the existing form, integrity and material of a building or structure, and the existing form and vegetative cover of a site. It may include initial stabilization work, where necessary, as well as ongoing maintenance of the historic building materials.
- *Rehabilitation* is defined as the act or process of returning a property to a state of utility through repair or alteration which makes possible an efficient contemporary use while preserving those portions or features of the property that are significant to its historical, architectural and cultural values.
- *Restoration* is defined as the act or process of accurately recovering the form and details of a property and its setting as it appeared at a particular period of time by means of the removal of later work or by the replacement of missing earlier work.

Each of these approaches has an application to certain types of buildings that may be found on a campus. Clearly, some buildings are true national or local monuments and merit strict preservation or restoration as memorials or museums. These buildings demand scrupulous consideration before any modifications are made.

5

While it is still possible to provide access to most of these buildings, for some the solution may require a willingness to seek a suitable compromise with the goal of full access, at least until new technology is developed.

The majority of older buildings do not have such rigorous constraints on their use or adaptation. For most campus buildings, the primary consideration is to ensure that any alterations or additions are compatible in design, detailing and materials. The success of efforts to save older campus buildings will often depend upon their capacity to function as working buildings. In such cases, provision for access will be essential to their future utility. The "conservation" or "continuity" philosophy is here seen in practice as buildings are changed in response to the needs of the time. The importance of this approach to the preservation movement was noted by James Biddle, former President of the National Trust for Historic Preservation, in the foreword to *Economic Benefits of Preserving Old Buildings*. As Biddle expressed it, "the quintessence of preservation (is) the integration of our architectural heritage with the present in a functioning relationship."

Adaptation of older buildings clearly lies within the mainstream of historic preservation philosophy, and has practical application to physical plant management for colleges and universities. The underlying rationale for this perspective was expressed by the British preservationist Osbert Lancaster, who has pointed out that each structure exists in time, with changes made by natural elements and by functional demands over the course of its life. Preservation, Lancaster says, "should aim at doing no more than maintaining a building in a state in which it is still capable of this long transformation." Viewed in this light, accessibility modifications to an old building are but another link in the chain of existence running from the building's origin through its uses in the past up to its present state. By making the building accessible to all its potential users while maintaining its historical integrity, that heritage of utility is assured a future.

CHAPTER 2

Designing Buildings for All People

A central requirement in modifying older buildings is the necessity of considering the actual needs of a wide range of people who will use the building, including those with mobility handicaps, with full or partial loss of sight or hearing, and with a variety of other activity limitations. Successfully balancing respect for both building and user sometimes poses an exceptional challenge.

The Mythical "Average Man"

Designers traditionally have drawn their plans with an idealized vision of the potential users in mind, an assumption that the user will be the "average man." In fact, the average man is a mythical creature. *Access for All: An Illustrated Handbook of Barrier Free Design for Ohio* cites statistics that specify the average American male as 71 inches tall and 24 inches broad across the shoulders, and his female cohort as 65 inches tall and 21 inches across the shoulders. However, a glance at a busy sidewalk reveals that Americans come in a multitude of shapes and sizes, and have a variety of physical capabilities and disabilities.

Access for All also provides the following information: If the "average" man breaks a leg, his width on crutches increases to 32.5 inches. If his female companion uses a walker, she will take up 28 inches in space. The average adult in a nonmotorized wheelchair also measures 28 inches in width. Any individual using a guide dog requires an additional six inches in space beyond body width.

When disabling conditions occur, the demands on the environment undergo a transformation. Steps, high thresholds and narrow doors all become obstacles to entering a building and using its spaces. Barriers such as small toilet stalls, unreachable drinking fountains, telephones and light switches placed high on the wall may make it impossible for a handicapped individual to stay in the building for any length of time. This denies the person the opportunity to participate in classes or programs conducted there.

Other disabilities may affect functioning in the environment in different ways. Loss of manual dexterity may make it impossible to turn doorknobs or operate other controls that require grasping, turning or fine hand control. Persons with sight or hearing impairments experience other sets of difficulties in dealing with the built environment. The listing below itemizes the functional problems related to different types of disabilities and lists the people affected by each type of disability. This listing suggests that the population in need of a more accessible environment is much larger than the group generally recognized as being physically handicapped.

Most recommended criteria for accessible design are based on the needs of four types of handicapped persons: individuals in wheelchairs; persons using crutches, canes or other mobility aids; blind or visually impaired people using long canes or dog guides; and hearing impaired persons. An expanded categorization of disabilities may be useful in planning for the wide range of handicaps that may be found on a given campus. A listing of typical conditions that should be considered would include:

- *temporary impairments*, encompassing fractures, pregnancy and convalescence from disease, trauma or operation. It has also been noted that the concept of temporary

Often, the drink of water is just out of reach.

handicap could be extended to cover those engaged in carrying or moving large or heavy loads.

- *activity impairments* other than mobility, visual or auditory impairments. This category generally describes persons suffering heart or lung diseases, neurological diseases that result in lack of coordination, or forms of arthritis or rheumatism. It also includes extremes of size and weight from dwarfism to obesity.

- *mobility impairments* (semiambulatory) that cause difficulty in walking, climbing, bending or otherwise curtail the mobility of the individual. This category includes persons who use crutches, canes, walkers, braces, artificial limbs or orthopedic shoes.

- *mobility impairments* (nonambulatory) referring to those disabilities that confine an individual to a wheelchair all or part of the time.

- *manual impairments*, either partial or total loss of manual dexterity in one or both hands.

- *visual impairments*, ranging from color blindness to dysfunctions such as loss of sight in one eye, cataracts or other ophthalmologic diseases.

- *hearing impairments*, including partial loss of hearing or total deafness.

- *aging*, which may have effects encompassing many of the conditions identified on this list.

The essential underlying premise for successful design that meets the needs of these handicaps is the same for both new construction and modification of existing facilities. It is, quite simply, to begin the planning process with complete awareness of the range of needs that must be accommodated. Starting from that basic understanding, the planner should focus on providing the same access to facilities for both handicapped and able-bodied users; in other words, the objective is to mainstream handicapped people. Mainstreaming avoids accessibility solutions that signal "special accommodations." Instead, mainstreaming emphasizes such things as making primary building entrances accessible and developing accessible routes of travel within major traffic flow patterns.

Accessibility is required in new buildings. The goal is complete avoidance of elements that would be obstacles to any users of the facility.

When modifying existing structures, however, constraints of space or structural characteristics may make it necessary to adjust the goal of complete elimination of barriers. It then becomes essential to establish priorities for accessibility features. Although the building use, number of floors and type of construction may influence the ordering of priorities, the following items in general are considered essential for minimum accessibility:

- *access to the campus site*, including reserved parking and other site accommodations for handicapped users.

- *access to buildings through a primary public entrance*, including a grade level or ramped approach, proper door width, minimum threshold, adequate door pull and ample vestibule space.

- *access to primary and support facilities*, such as classrooms, laboratories, libraries, health services and administrative offices. Assessments of immediate needs in terms of curriculum demands and essential services will determine the buildings in which primary use facilities must first be made accessible. Clearly, dining facilities, post offices, dormitories and apartments would also be among essential facilities. Access includes interior ramps, elevators, seating accommodations and proper door widths.

- *access to toilet rooms and other necessary facilities*, such as drinking fountains and telephones. These facilities should be accessible in any building where a handicapped individual would spend an extended period of time — more than one-half hour, as a rule. Ideally, one toilet stall in each rest room in a building would be made accessible. As a minimum, at least one rest room per sex should be made accessible. However, in certain older buildings, this may not be possible. In a few cases, where allowed by code, the addition of a unisex toilet room may be accomplished more easily than alteration of existing facilities.

- *access to cultural, recreational and extracurricular student life activities*, including swimming pools, bowling alleys, theaters, student unions and other campus facilities.

Designing Total Access Systems

In planning accessibility modifications, it is important to review accessibility features as a total system — a continuous accessible route of travel from parking and public walkways into and through the building. The failure of any one element of this system can negate the accessibility of the total facility. Conversely, taking the systems approach to accessibility may reveal some areas where planned alterations are redundant.

Looking at vertical circulation as a whole, for example, may suggest certain changes and indicate that others are not essential. Where elevators provide vertical access, it will be less important to remodel existing stairs. However, if transfer between levels is accomplished by ramps, then stairs must also meet accessibility criteria to be usable by people with braces and crutches who may be unable to negotiate a ramp.

Specific design criteria for modifications may vary depending on a number of circumstances. Where federal funds are involved, the funding agency often will have promulgated an accessibility standard. HEW's Section 504 regulations reference the American National Standards Institute (ANSI) A117.1 (1961, reissued 1971), "Specifications for Making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped," as the minimum standard. In other cases a state, local or campus building code may impose more stringent requirements.

A good basic reference on designing environments usable by all is ANSI A117.1 (1980). Copies of this standard are available for sale from the American National Standards Institute, 1430 Broadway, New York, New York 10018.

Preservation Standards and Accessibility

When designing accessibility modifications to historic buildings, four key criteria can be suggested:

- Avoid physical damage to historic and artistic features if alteration is necessary.

- Select sympathetic materials and design vocabulary where additions to an older building must be made, including elements such as ramps and signage and equipment such as elevators and alarm systems.

Sensitive planning can add an access ramp without disturbing the architectural harmony of a classic exterior. Here a gently sloped ramp (less than 5% grade, to eliminate the need for handrails) is screened by the brick pedestal as it leads up to the main entrance of a Georgian-style building, Brown Laboratory at the University of Delaware.

- Locate new elements or equipment within an older building with sensitivity and respect for their contextual surroundings.
- Use the concept of "reversibility" in making accessibility alterations or additions; that is, design any such elements so that they can be removed in the future, leaving the original structure essentially intact, should later developments afford a better or different solution.

The National Trust for Historic Preservation, according to its paper on "Handicapped Access and Historic Preservation," has based its approach to accessibility in its historic house properties on two fundamental points. The first is that "the handicapped must be considered and treated, as far as feasible, as an integral part of the total visiting public," and the second, that the term "handicapped" describes "a group of people with widely varying kinds and degrees of disability, requiring a wide range of approaches to achieve appropriate accessibility and interpretation."

Accessibility requirements need not conflict with standard practices in restoring or rehabilitating historic buildings. Several publications listed in the Bibliography can help readers ensure that plans for accessibility modifications are compatible with preservation standards.

The American Institute of Architects has affirmed a policy of encouraging "the sensitive and considerate application of requirements for the handicapped to historic properties in a manner that maintains important design features." Applying that sensitivity and consideration both to the fabric of the building and to the abilities and disabilities of the people who use it will make it possible to meet the challenge of providing access to older buildings.

CHAPTER 3

Laws and Policies Governing Preservation and Access

In the United States' system of laws, issues deemed to be in the public realm are codified by laws and controlled by regulations. Both protection of historic properties and provision of accessible environments for handicapped people are governed by a network of local, state and federal statutes. The major federal legislation governing preservation and access is listed at the end of this chapter. The requirements of both sets of laws must be coordinated when addressing problems in historic buildings.

Protection for Historic Properties

The federal government, through Congress and the Executive Branch, has long recognized the public benefits of historic preservation both for its own sake and for the collateral benefits it provides. Congress has repeatedly proclaimed that preservation of the nation's historical, architectural and cultural resources is a national policy.

The Antiquities Act of 1906 (Public Law 209) recognized government responsibility for preservation but was restricted in scope to structures and objects on U.S. government property. The Historic Sites Act of 1935 (Public Law 74-292), as amended, expanded the national historic preservation policy by delegating to the Secretary of the Interior, through the National Park Service, responsibility for carrying out the particulars of the 1935 Act's stated aim: ". . . that it is a national policy to preserve for public use historic sites, buildings and objects of national significance for the inspiration and benefit of the people of the United States." Under this law, the National Park Service was empowered to conduct surveys of buildings and sites to determine their significance, conduct research on them, acquire important sites, cooperate in preservation projects, restore and maintain buildings and sites, and develop educational programs pertaining to these buildings and sites.

The National Trust for Historic Preservation was chartered in 1949 by Public Law 81-408 as a private, nonprofit organization with the responsibility of encouraging public participation in the preservation of sites, buildings and objects significant in American history and culture.

Most important of the federal laws offering protection is the National Historic Preservation Act of 1966, (Public Law 89-665), which established the National Register of Historic Places and created the Advisory Council on Historic Preservation. Under Section 106, federal agencies are required to take into account the effect their undertakings will have on National Register properties and those declared eligible for the Register. The Advisory Council is responsible for monitoring the performance of federal agencies in this area and is empowered to review federal undertakings involving historic properties. Federal undertakings include both federal projects and other projects funded by or having the approval or other non-financial support of a federal agency.

Other federal actions relating to historic preservation include Public Law 93-291, the Preservation of Historic and Archaeological Data Act of 1974, and a body of regulations that includes the "Advisory Council on Historic Preservation Procedures for Protection of Historic and Cultural Properties" and the Secretary of the Interior's "Standards for Preservation Projects."

These laws have stressed the complementary roles of the federal government and the private sector. The National Historic Preservation Act declared a national policy for historic preservation recognizing it to be

> "necessary and appropriate for the Federal Government to accelerate its historic preservation programs and activities, to give maximum encouragement to agencies and individuals undertaking preservation by private means."

The Public Buildings Cooperative Use Act of 1976 and the Tax Reform Act of 1976 have encouraged private preservation activities by directing the General Services Administration to acquire, by lease or purchase, federal office space in historic buildings and by offering tax incentives to persons renovating historic buildings. In 1971, Executive Order 11593 further directed federal agencies to ensure that their plans and programs contribute to the preservation and enhancement of non-federally owned historic properties.

These acts, moreover, have acknowledged the decisive role of private preservation efforts by specifically enacting programs to encourage organizations to undertake preservation projects by private means. For example, the National Historic Preservation Act created a matching-grant-in-aid program to assist both public and private preservation efforts. Similarly, preservation activities specifically qualify for funding under the Community Development Block Grant program of the Department of Housing and Urban Development and the Emergency Local Public Works program of the Economic Development Administration.

While the federal government maintains the National Register of Historic Places and has established a review process to protect historic properties from detrimental effects of federally funded or directed programs, private action affecting historic properties is regulated primarily at the state or local level.

The earliest state preservation laws were enacted in Louisiana, Massachusetts and South Carolina, a reflection of local concern for safeguarding the heritage embodied in New Orleans, Boston and Charleston. Today, there is legislation in every state. All of the laws deal with the establishment of state historic preservation agencies; some deal with historic districts, others address taxation, review of projects, financial assistance, building costs and other special topics.

Mandates for Accessibility

The Architectural Barriers Act of 1968 requires that all buildings and facilities owned, occupied or financed by the United States government be accessible to and usable by handicapped persons. Specifically, this law applies to buildings and facilities designed, constructed, altered or leased by the federal government after August 12, 1968, and to those whose construction was financed wholly or in part with federal funds. Responsibility for establishing accessibility standards for all such buildings and facilities is assigned to the Administrator of General Services, the United States Postal Service, and the Secretaries of the Departments of Housing and Urban Development and Defense, in consultation with the Secretary of Health, Education and Welfare. Enforcement of compliance rests with the federal agencies and the Architectural and Transportation Barriers Compliance Board.

This act would apply to construction funded through federal programs such as the Higher Education Facilities Act and the College Housing Loan Program. In September, 1969, the General Services Administration and several federal agencies adopted ANSI A117.1 as the standard for compliance. Therefore, most facilities constructed since September, 1969 with federal support must comply with ANSI A117.1 (1961, R 1971). Application of the Architectural Barriers Act is a complex issue that should be studied carefully by recipients of federal funding.

The passage of the Rehabilitation Act of 1973 (Public Law 93-112) broadened the coverage of accessibility requirements of higher education. Section 504 of this Act states:

"No otherwise qualified handicapped individual in the United States . . . shall, solely by reason of handicap, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."

HEW's regulations implementing Section 504 became effective on June 3, 1977. These regulations require recipients of HEW funds to make all programs and services accessible to qualified handicapped individuals. To accomplish this, retrofit of existing buildings may be necessary. Any structural alterations that are necessary to achieve program accessibility must be completed by June 3, 1980. Further, all new construction must be free of barriers. Thus, current recipients cannot delay compliance.

The concept of program accessibility, a key term in Section 504, is that of ensuring that all federally assisted programs and activities, when viewed in their entirety, are accessible to handicapped persons. Program accessibility does not require that all existing facilities be made accessible, so long as the programs and activities, as a whole, are accessible. Thus a college or university may provide for full participation for handicapped students, staff and faculty without renovating every existing classroom building, office space or dormitory. This requirement for program rather than facility accessibility may relieve some schools from the necessity of extensively renovating older structures. If, however, an older building houses programs or activities not available elsewhere, or serves a ceremonial or traditional function that can be considered part of the institution's program, then physical access for handicapped individuals may be required.

In addition, the regulation requires that any alternations made to a facility or part of a facility that could affect the usability of the building must "to the maximum extent feasible" make the altered facility or portion of the facility accessible to and usable by handicapped persons. For example, if a doorway or wall is being altered, the door or other wall opening must provide the necessary clearance to accommodate people in wheelchairs. If, on the other hand, the roof were being replaced, there would be no requirement for accessibility features since the alteration cannot be done in a way that would affect accessibility of the building. This requirement, which applies to any alterations undertaken after June 3, 1977, could affect a significant number of campus buildings as older structures are systematically rehabilitated. If fully implemented, Section 504 of the Rehabilitation Act and the Architectural Barriers Act together will have far-reaching impact on older buildings.

In addition, many states and local jurisdictions have some type of law on the books regarding architectural barriers. Most of these laws preceded passage of federal legislation. The coverage of these laws varies greatly. Some legislation covers only state-owned or state-funded new construction; some requires accessibility features to be included in any major alterations for such projects; and still other laws call for accessibility in all publicly used buildings, such as theaters, restaurants, hotels, multifamily residential units, and similar commercial, industrial or health installations.

Standards and Codes

Federal, state and local accessibility requirements are implemented through the application of design specifications or standards, generally enforced by means of building codes. American National Standards Institute (ANSI) A117.1, "Specifications for Making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped," is the original, and still most widely used, accessibility standard. First issued in 1961 and reissued without change in 1971, the original edition is officially designated as ANSI A117.1-1961 (R 1971). An extensive research project, conducted from 1974 to 1979, has culminated in a revised and expanded document, ANSI A117.1 (1980).

ANSI standards do not have the force of law. They are, rather, a recommended set of *minimum* design criteria established to serve as the basis for codes and regulations. The purpose of ANSI A117.1 is to specify a uniform set of minimum requirements below which the detailed requirements of codes and regulations should not fall.

A standard has the force of law only when it is specifically referenced in a building code, regulation or legislative act. Following its issuance in 1961, ANSI A117.1 was adopted in many of the building codes, regulations and state accessibility laws. It has also been adopted by many fed-

eral agencies and is the standard for design of new facilities and alterations referenced in HEW's Section 504 regulations. Wherever ANSI A117.1-1961 (R 1971) is referenced — as it is in HEW's regulation — the 1980 revision will not apply unless and until each regulation, code or statute is amended to include it.

In general, the state building code will be the mechanism by which an accessibility standard is enforced for all state projects and by those local municipalities enforcing the state code on non-state-owned work. Some states, however, authorize lower governmental jurisdictions to develop their own building codes. Major metropolitan areas and, in some cases, urban counties frequently adopt a code other than that enacted by the state.

Originally, building codes applied primarily to new construction. Concern for making existing buildings meet code requirements is relatively recent. This concern has prompted the development of "alternative" codes governing areas such as accessibility and historic buildings.

The initial accessibility provisions of many state building codes were based on ANSI A117.1-1961 (R 1971) in whole or in part. As practices and expectations changed after 1961, jurisdictions increasingly amended their original codes or adopted new ones — either original specifications or adaptations of the major model building codes — that have more stringent requirements than ANSI A117.1-1961 (R 1971). However, this does not necessarily mean that a local code is in conflict with the ANSI standard. Compliance with the stricter code, where a difference exists, usually ensures compliance with the less stringent requirement. In addition, most state and local codes, as well as HEW's regulations for implementing Section 504, provide for approval of accessibility modifications other than those specified in the referenced standard, if equivalent or better access is provided by the alternate means.

Although many building codes are based on one of three major model codes and most accessibility requirements follow ANSI A117.1-1961 (R 1971) relatively closely, it is impossible to generalize about local code requirements. Most codes will differ, if not in design specifications, then in scope and coverage of the accessibility requirements.

When the Issues Converge

When federal actions will affect a historic property, a review process must be conducted with participation by the State Historic Preservation Officer, the Advisory Council on Historic Preservation, the federal agency involved, and interested individuals and organizations. This review is designed to assure that alternatives to avoid or mitigate an adverse effect on properties listed on the National Register of Historic Places are adequately considered in the planning process. The requirements also apply to other properties eligible for listing on the National Register.

Recognizing the likely increase in alterations to historic buildings caused by the implementation of Section 504, the Advisory Council published "Supplementary Guidance: Handicapped Access to Historic Properties" in the *Federal Register* on February 13, 1980.

"For those rare cases in which a historic property could not be rendered accessible without substantially impairing significant historic features," the guidelines support the waiver of access standards by the responsible federal agency. Some preservation organizations, such as the National Trust for Historic Preservation, are urging a stronger statement; therefore, they do not fully accept the Advisory Council's guidelines.

When projects do not qualify as a "federal undertaking" under Section 106 of the National Historic Preservation Act, final determination of appropriate accessibility modifications to historic properties will be governed primarily at the state or local level. In some states, building codes may offer special protection to historic properties. According to a 1979 report of the National Trust for Historic Preservation, "Significant State Historic Preservation Statutes," five states now cover historic or older structures in their building codes. The states cited were California, Connecticut, Idaho, Massachusetts and South Dakota.

Of these, at least one — California — has developed accessibility requirements for historic structures. These requirements are embodied in a chapter of the State Historical Building Code adopted in August, 1979. This chapter of the code covers historical buildings in all local jurisdictions that have adopted the State Historical Building Code. In those jurisdictions that have not adopted the historical code, the current state accessibility standards will apply to all remodeled or renovated historic buildings. The text of the California chapter on access to historic buildings is reprinted in Appendix B.

In addition to protection that may exist in state building codes, state or local preservation laws may contain provisions that would affect accessibility projects, such as requirements for review of proposed alterations by an historic preservation review board.

Beyond formal reviews by historic preservation authorities, either federal or local, many building codes include waiver or modification clauses that allow for alternate methods of compliance in justified cases. Other codes may include appeal provisions to obtain permission for alternate accessibility measures that are considered desirable for a particular historic building.

Neither the 1961 (R 1971) nor the 1980 edition of ANSI A117.1 makes exception for historic buildings. However, the 1980 version does suggest certain areas in which an authority adopting the standard may want to consider adaptation of the standard to meet local needs. These include types of occupancy, types of buildings to be covered and the extent to which the coverage shall apply. ANSI A117.1 (1980) also suggests differentiating between new construction and work on existing buildings.

Each of the model codes, on the other hand, does include historic building compliance modification clauses that allow acceptable alternatives if the basic intent of the code is met. The underlying rationale of this approach is to allow for creative and innovative methods of compliance to be developed and implemented, so long as the alternate method fulfills the purpose of the code. As the California access code recognizes, cases will occur when the historic fabric of a building may be adversely affected by strict application of accessibility requirements. However, an acceptable measure of access may be achieved in such cases using methods not strictly permitted under codes that were written primarily to guide new construction.

Major Federal Legislation Governing Preservation and Access

This listing contains citations for the major legislation affecting accessibility modifications in historic buildings. The legislation in each area is listed in chronological order. Public Law numbers and legal citations are included as completely as possible to enable readers to locate the legislation and any amendments or updated information relating to the legislation.

Preservation of Historic Properties

Antiquities Act of 1906 (Public Law 209, 16 USC § 431 *et seq.*)

12

Historic Sites Act of 1935 (Public Law 74-292, as amended, 16 USC § 461 *et seq.*)

Act Creating the National Trust for Historic Preservation, 1949 (Public Law 81-408, as amended, 16 USC § 468 *et seq.*)

National Historic Preservation Act of 1966 (Public Law 89-665, as amended, 16 USC § 470 *et seq.*)

Executive Order 11593, Protection and Enhancement of the Cultural Environment (36 FR 8921, May 13, 1971, printed at 16 USC § 470)

Preservation of Historic and Archeological Data Act of 1974 (Public Law 93-291, as amended, 16 USC § 469 *et seq.*)

Public Buildings Cooperative Use Act of 1976 (Public Law 94-541, 40 USC § 490, 601a, 606, 611, 612a)

Tax Reform Act of 1976 (Public Law 94-455, 26 USC § 1 *et seq.*)

"Advisory Council on Historic Preservation Procedures for Protection of Historic and Cultural Properties" (36 CFR Part 800, as amended, 44 FR 6068, January 30, 1979)

Secretary of the Interior's "Standards for Preservation Projects" (36 CFR Part 1207)

Access to Handicapped Persons

Architectural Barriers Act of 1968 (Public Law 90-480, as amended, 42 USC § 4151 *et seq.*)

Section 504 of the Rehabilitation Act of 1973 (Public Law 93-112, 29 USC § 794)

Rehabilitation Act Amendments of 1974 (Public Law 93-516, 29 USC § 706)

Executive Order 11914, Nondiscrimination in Federally Assisted Programs (41 FR 17871, April 28, 1976, printed at 29 USC § 794)

Department of Health, Education and Welfare Regulations: Nondiscrimination on the Basis of Handicap in Programs and Activities Receiving or Benefitting from Federal Financial Assistance (45 CFR Part 84, 42 FR 22676, May 4, 1977)

Department of Health, Education and Welfare Regulations: Implementation of Executive Order 11914 (45 CFR Part 85, 43 FR 2132, January 13, 1978)

Access to Historic Properties

Advisory Council on Historic Preservation, "Supplementary Guidance: Handicapped Access to Historic Properties" (45 FR 9757, February 13, 1980)

NOTE: The citations following the name of each law follow the standard format for legal references. The following format is used to indicate the volume and location in which the legislation would appear.

Code of Federal Regulations (CFR) Citations: Title Number, CFR, Part Number

Federal Register (FR) Citations: Volume Number, FR, Page Number, Date

United States Code (USC) Citations: Title Number, USC, Section Number

CHAPTER 4

Barriers by Tradition

In both old and new structures, those features of the built environment that constitute barriers to handicapped people have roots that go back to man's earliest building endeavors. Originally these features served utilitarian or psychological functions that were important to their time and place. Despite the fact that they are anachronistic today, many such elements are basic to the design of older buildings and continue to be built into modern structures.

Barriers can be traced to several factors. The traditional design vocabulary of public buildings is the most significant factor in the types of older buildings typically found on college campuses. The monumental steps common to so many chapels, libraries, classroom buildings and similar structures have architectural origins at least as old as recorded history, and have been imbued with key symbolic roles over time. The elevated structure gives an impression of power or importance intended to reinforce the influence of the activity that takes place within.

Interiors of important buildings often employed changes in floor level to separate classes of activity or classes of participants. Secular and religious functions within cathedrals, for example, could be delineated by placing the most sacred functions in a space where the elevated floor suggested the higher purpose of the activity. The laity, meanwhile, could be left to observe from their lower vantage point. Though its purpose largely has been lost, the arbitrary change in floor level remains a popular architectural device today.

Other building elements that create barriers have their origins in more functional considerations. Early cities grew up along rivers, and elevated building sites were sought to escape floods. If suitable natural sites were not available, buildings would be artificially raised by constructing mounds or building on poles. Even where such extreme measures were not common practice, wooden floors were raised above ground level to avoid contact with the damp earth. Thresholds were installed at doorways to keep out drafts or rain.

Other barriers that are frequently encountered arose later. For example, many building codes prohibit using a basement as a habitable space if it is fully below ground. This led to the use of the "half basement" with windows above grade, resulting in the common situation where the entrance is several steps above grade. In many instances, this entrance is also located at mid-level between basement and first floor, creating yet another barrier inside.

Down through classical antiquity and into modern times, these and other building features have been incorporated into the architectural vocabulary. Their use has been perpetuated long after necessity ceased.

Other accessibility problems exist in older buildings beyond those imposed by the style of architecture. As these buildings have been adapted over the years, the changes that resulted have also contributed to their present inaccessibility. Toilet rooms added to existing buildings were frequently tucked into small, inconveniently located spaces. New wings for an old building often accommodated a sloping site by changing the floor level, thus placing interior steps in corridors.

13

Traditional design elements can be insurmountable obstacles to students, faculty or staff experiencing permanent or temporary disabilities.

Stairs provide the only means of moving between floors in most older buildings.

The focus of these structures was not on the user, who in any case was typically, conceived to be an able-bodied person, but on the design concept embodied by the building. The Greek Revival building incorporated the traditional elements of early Greek architecture, and the user either adapted to this environment or did not use it. On today's campus the successful building must function well both for its particular use and for all people who will use it.

Recognizing that the features that create barriers may be integral to the architectural elements for which the building is valued, the planner must find solutions that will circumvent the problem without compromising the aesthetic integrity or historic value of the structure.

The most frequent major design challenges relating to older buildings are:

- building setting and site problems
- problems getting in the buildings
  - principal entrances above grade
  - heavy doors with high thresholds
  - sunken and split-level foyer entrances to buildings
- problems getting around in the buildings
  - changes in level within a given floor, the "split-level corridor" feature. Frequently these changes in level have resulted from additions to a building over the course of campus development. In some cases, changes in level extreme enough to create a barrier are the consequence of the settling of a building over the years.
  - lack of space for ramps, interior and exterior, that may inhibit plans to eliminate steps in the path of travel
  - narrow interior doors
- problems in moving between floors within the buildings
  - lack of elevators in multistory buildings
  - inaccessible existing elevators
- problems involving access to toilet rooms
  - raised floors within
  - buildings without toilet rooms on the main floor
- unusable drinking fountains
- inaccessible living facilities
- lack of signage for visually impaired persons

Other typical problems specifically relate to modification of older structures:

- necessity of working with building materials that are expensive to replace and difficult to match
- matching the level of craftsmanship in the original construction
- structural difficulties, particularly with interior bearing walls and floors, and walls that sometimes are almost a foot thick

Developing appropriate designs for modifications is a problem more likely to be experienced in an older structure than in newer facilities. When historic or sentimental associations are connected with the building, the need to maintain architectural integrity assumes greater significance. For example, at Iona College, the major constraint in modifying that campus' buildings is the emotional attachment of the Irish Christian brothers who were educated there. Virtually every school will have at least one building for which its alumnae feel such an attachment.

The pride a community takes in its older campus buildings may affect the design process at several points. Extensive research into appropriate approaches and painstaking refinement of the design are required in order to meet aesthetic standards imposed by a concerned community. This combines with the necessity for the designer to present and justify the plans at public hearings and to obtain approval of various boards and committees, all of which can add significantly to time — and money — consumed in the design phase.

CHAPTER 5

Developing Access to Older Buildings

While most campuses have only recently addressed the need to make facilities accessible to handicapped individuals, some schools have been removing barriers for more than a decade. For example, the University of Wisconsin has more than a dozen older or historic buildings that have been made accessible through a program that started approximately fifteen years ago. Other campuses have just embarked on preservation projects that include accessibility features. Regardless of how recently they have confronted the issue, colleges and universities already have amassed impressive experience in dealing with the typical barriers found in older buildings.

Many of the solutions to accessibility problems implemented by campuses may be useful to others in the process of designing accessibility alterations for both old buildings and more recent structures.

These solutions address the problems noted in the previous chapter and emphasize the development of accessibility systems within older buildings.

The Building In Its Setting

Frequently site and vegetation are important elements in the grace and harmony of an older building. The site can also present barriers to accessibility, and the removal of these barriers should be handled with the same sympathy for design and scale that is necessary in planning alterations to the building itself. At the University of Delaware, a graceful walk (Fig. 1) offers a choice of steps or a gentle slope to pedestrians crossing the campus.

Site access considerations include the provision of reserved parking spaces, close to accessible building entrances, that have the necessary extra width to permit an individual in a wheelchair to maneuver in and out of a car. Access also requires an accessible route of travel from parking, passenger drop-off and pedestrian approach zones to the accessible entrance. An important element of access planning at the University of Alberta is the evaluation of parking, pedestrian walkways and the routes of the accessible bus system as these factors relate to various potential schemes for building alterations.

Fig. 1 Changes in level can be handled with a gentle slope as well as with steps; the University of Delaware offers pedestrians a choice with this charming walk.

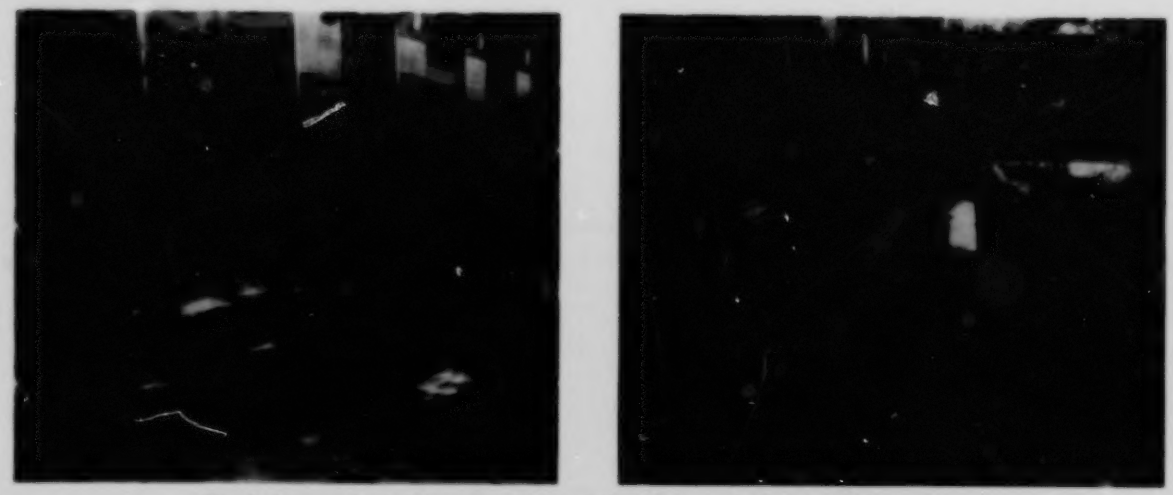


Fig. 2 A sympathetic addition to the University of Delaware's Hullihen Hall provides an attractive means of access.

Getting In

The imposing flight of steps leading up to a broad portico and a raised entrance is perhaps the most intimidating of typical entrance barriers found in older buildings. Equally frustrating can be the less formal entrance with two or three steps that is overlooked easily by the able-bodied but poses a problem for handicapped people. A number of solutions have been found to overcome such barriers.

Adding Ramps

An obvious means of overcoming stairs is the construction of a ramp. When a ramp is added to an existing building, it is important that the ramp be compatible in design and materials with the building it serves. The significance of this consideration is intensified when the existing building has particular architectural merit.

At the University of Delaware, sensitivity to the design of the buildings is manifest in the treatment of the ramps added for accessibility to DuPont and Hullihen Halls (Fig. 2). Materials, line and scale of the ramps were carefully orchestrated for aesthetically satisfying alterations to handsome buildings. Landscaping provides the final harmonious detail.

The University of Kansas has developed plans for a major historic restoration that includes accessibility modifications to be carried out in Spooner Hall, the oldest building on campus. Built in 1894 as a library, Spooner Hall (Fig. 3) was designed by Henry Van Brunt in the Romanesque Revival style and is listed on the National Register of Historic Places. In the proposed design, a ramp will be built parallel to a retaining wall and will lead up onto the covered entry portico (Fig. 4). This ramp will permit all users of the building to enjoy the same approach through the original entryway. A future elevator to be installed just inside the entrance will provide access to all levels of the building.

A ramp on the campus of Gallaudet College illustrates the concept of "reversibility" in making accessibility alterations. Reversibility is the design of changes or additions that can be removed in the future, leaving the original structure intact, should new developments afford a better solution. At Gallaudet, a ramp was added to Chapel Hall, built in 1879 and part of the College's Historic District (Fig. 5). Though built of concrete and designed as a permanent structure, the ramp is free-standing and is attached to the building only by a removable threshold at the entrance door. Therefore, the ramp could be removed and the original wall and entrance would remain exactly as built in 1879. The ramp was designed in a straightforward manner that expresses its functional purpose without any attempt to imitate the style of the building. Located at a side entrance (which provides the most convenient access to services inside) it does not interfere with the primary façade of the building, nor is it visible from the major traffic routes that circle the building. Attractive landscaping complements the ramp and, the total effect of the project is an aesthetic improvement over the elevation as it appeared prior to construction.

Plans are now underway to make another historic building on the Gallaudet campus accessible by adding a ramp. A preservation grant-in-aid from the Department of Interior was awarded to assist with the adaptive use remodeling of the "Old Gym," which was the second college gymnasium built in the nation when it was constructed in 1880, and the first gymnasium to include a swimming pool. The new ramp will lead onto the entry landing that is the principal entrance to the building, and will be faced with brick to match the building's exterior. The wooden railing that will be removed to make way for the ramp will be saved for use in repairing millwork on the other side of the covered landing (Fig. 6).

Designers should be aware that ramps providing access to some wheelchair users are also barriers to some persons who are more severely handicapped. A ramp 30- to

Fig. 3 Spooner Hall, The University of Kansas' oldest building, is shown here as it appeared as a new library in 1894. The building is now the Museum of Anthropology.

60-feet in length can be a drain on the strength of a manual wheelchair user and a drain on the battery of an electric wheelchair. When wet, ramps may become slippery and dangerous to use. In cold climates, snow and ice may make uncovered ramps impassable.

Installing Wheelchair Lifts

Although ramps are sometimes the best solution, a search for a design response to access problems should not stop with consideration of a ramp, since other options are available. Some schools, including Middlesex County College, Dalhousie University, Montana College of Mineral Science and Technology, Pennsylvania State University and West Virginia University, have installed wheelchair lifts at entrances.

Two types of wheelchair lifts (Fig. 7) are available: the lift that travels a straight vertical path and may be adapted for indoor or outdoor use and the interior lift that follows the incline of the steps.

When comparing costs of installing wheelchair lifts and other alternatives, campuses should consider the maintenance costs of lifts and problems with "down time" when lifts need repair. These costs can add significantly to installation costs.

Many lifts are constructed with safety devices, including handrails for supporting passengers using crutches, cranks for manual operation and weatherproofing. Many handicapped persons, given the choice of a long ramp or a lift, would use the lift. Handicapped persons should participate in decisions such as the choice between installing a lift or ramp.

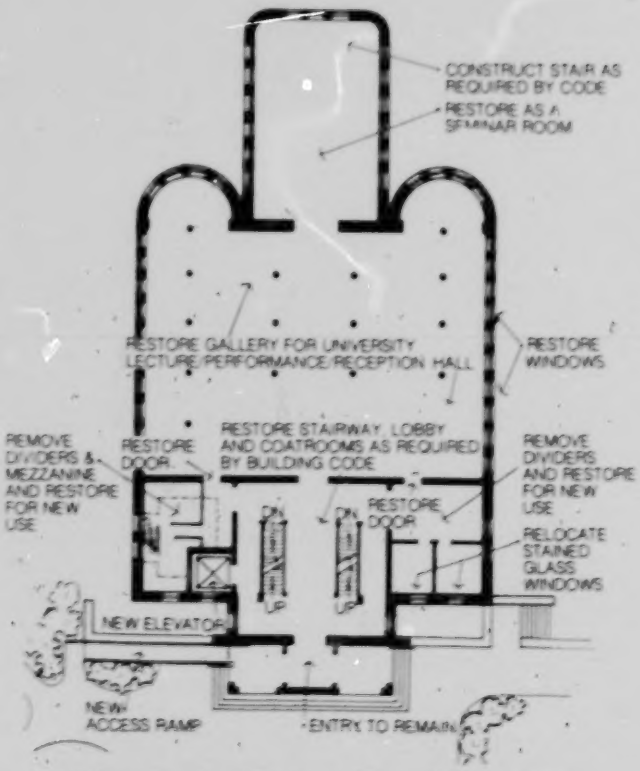

CONSTRUCT STAIR AS REQUIRED BY CODE
RESTORE AS A SEMINAR ROOM
RESTORE GALLERY FOR UNIVERSITY LECTURE/PERFORMANCE/RECEPTION HALL
RESTORE WINDOWS
REMOVE DIVIDERS & MEZZANINE AND RESTORE FOR NEW USE
RESTORE DOOR
RESTORE STAIRWAY, LOBBY AND COATROOMS AS REQUIRED BY BUILDING CODE
RESTORE DOOR
REMOVE DIVIDERS AND RESTORE FOR NEW USE
RELOCATE STAINED GLASS WINDOWS
NEW ELEVATOR
UP
NEW ACCESS RAMP
ENTRY TO REMAIN

Fig. 4 The proposed modification to Spooner Hall includes a ramp built parallel to a retaining wall and leading up onto the covered entry portico.

Fig. 5 Gallaudet College's Chapel Hall was made accessible by the addition of this ramp, which appears to be a permanent structure. The ramp was designed to be free-standing, connected to th building only by a removable threshold, so that it could be removed and leave the historic buildi unchanged. Note the landscaping that helps to soften the impact of the ramp.

Removing Steps

Other techniques may involve eliminating the steps entirely. At Pennsylvania State University, a flagstone walk leading to a stepped threshold was removed and the flagstone saved. The walkway was then filled and graded to create an inclined walk, resurfaced with the original flagstone,which ends flush with the existing doorway threshold. Sodding at either side of the new walk completed the project. The total cost was $200.

For those buildings where removal of steps would be considered destructive to an important architectural element, a modification to the University of Delaware's DuPont Hall (Fig. 8) illustrates an alternate solution. The Georgian-style building is constructed with the characteristic portico having steps up to the entrance door as well as leading down to the walk. To provide access without destroying the visual unity and symmetry of the architecture, the entire portico was raised to the level of the entrance door and a gently sloping walk was built up

Fig. 6 A ramp will be added to this entrance of Gallaudet College's Old Gym.

Fig. 7 Two types of wheelchair lifts: the lift that travels a straight vertical path and may be adapted for indoor or outdoor use (top), and the interior lift that follows the incline of the steps (bottom).

to the level of the portico at its side elevation. Appropriate landscaping and a brick wall executed in a style compatible with the building ensured that the completed project retained the significant characteristics of the original portico.

Where the change in grade is relatively slight, steps can sometimes be eliminated by regrading the immediate area. This technique was applied at one of the University of Wisconsin's most historic buildings (Fig. 9). The main sidewalk serving a major entrance to the building is four steps below the grade of the entrance. A second walk was installed on the higher level and parallel to the lower sidewalk. This walk is level throughout its length, following the slope of the site down to street level, where it ends at a bus stop. To complete the accessible entrance, the approach to the door was regraded to eliminate steps at the entrance landing.

Landscaping and Grading

Generally, regrading is less expensive than ramping. At Michigan State University, ramps were designed for entrances to four buildings before it was found that regrading would eliminate the need for ramps and save 65 percent of the construction cost. There is an additional spillover benefit reported by campuses in heavy snow areas. Eliminating steps makes it possible to use mechanical snow removal equipment rather than costly and slow hand shoveling.

Where the grade change is greater, more extensive earthworks may be required. The University of Alberta created an accessible entrance to the Administration Building by constructing an earth berm as the base for a straight-run inclined walk furnished with handrails. The berm was finished with landscaping and a cedar retaining wall. Cost of the entire project was $25,000. However, preservationists may not consider this type of solution entirely appropriate or acceptable when an important historic building is involved.

At Lansing Community College, three Victorian style former residences now used for office and conference space are being given first-floor accessibility as part of a larger construction and landscaping project. Excavated earth from the adjacent construction site for the new Large Group Instructional Center will be used to build earth berms leading to the porches of each of the three buildings (Fig. 10). These porches, meanwhile, will have been raised to the level of the existing thresholds at the entrance doors. Landscaping of the area will complete the project, which has an estimated cost of $50,000. This system of walks will form links to an accessible path for the entire complex of old and new buildings, which is part of a comprehensive project on the northwest portion of

Fig. 8 Portico and steps are basic elements in the design of this Georgian-style building, DuPont Hall at the University of Delaware (left). To provide access, the portico was raised level with the door, and a ramp was constructed leading up to the side of the portico landing. Note the brick wall (right) which provides a support for a handrail, screens the ramp and preserves the gracious facade.

the campus to provide access, pedestrian control, privacy and sound buffers from traffic.

When landscaping or grading is used to eliminate steps or level changes, possible [illegible] runoff problems should be considered.

Replacing Doors

Heavy entrance doors are another characteristic of older buildings. Many colleges and universitites routinely replace heavy doors with lighter-weight doors designed in

Fig. 9 The University of Wisconsin's oldest building, Bascom Hall, has several accessible entrances. This one is an example of the use of site grading to achieve access. The inclined walkway at the right blends into the path leading to the entry, which has been graded to eliminate steps and threshold.

Fig. 11 Automatic doors combine with sloped walk and handrails to provide the University of Texas' Hogg Memorial Auditorium with an accessible entrance. The power doors match the companion entrances, and the handrails are harmonious in scale and materials with the balcony railing.

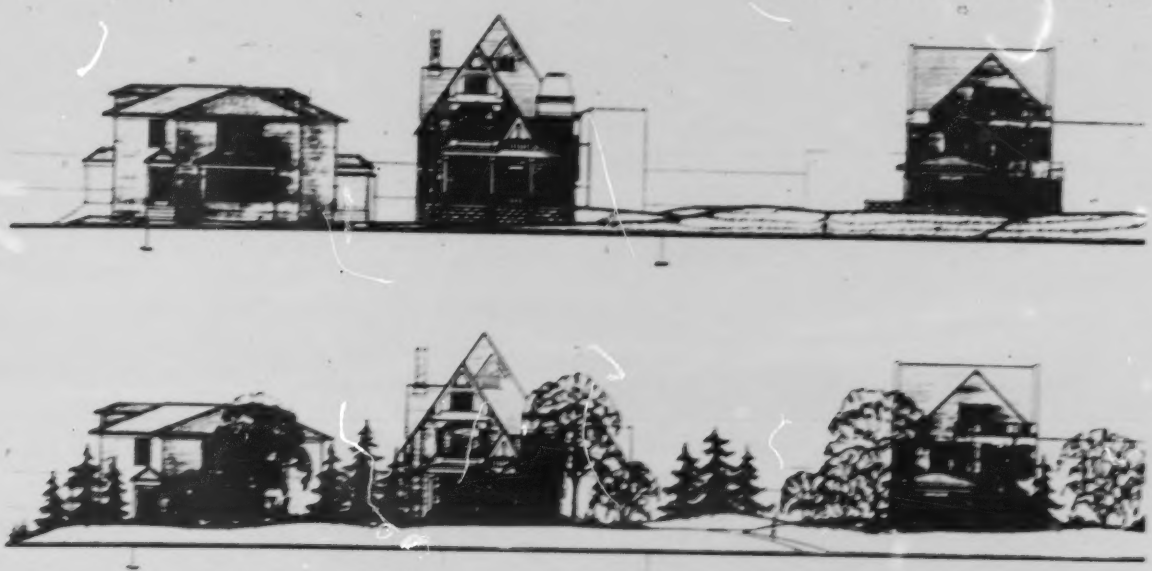
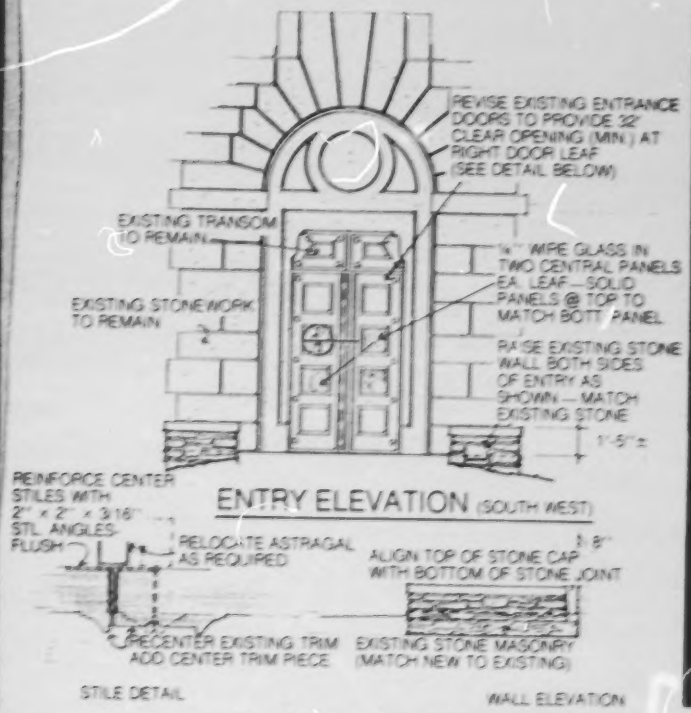


Fig. 10 Access to three buildings at Lansing Community College will be achieved by clever use of berms, combined with alteration projects to raise porches level with entry doors. With landscaping in place, the result will be a charming group of three buildings, all with first-floor accessibility – and without a ramp in sight.


REVISE EXISTING ENTRANCE DOORS TO PROVIDE 32" CLEAR OPENING (MIN.) AT RIGHT DOOR LEAF (SEE DETAIL BELOW)
EXISTING TRANSOM TO REMAIN
¼" WIRE GLASS IN TWO CENTRAL PANELS EA. LEAF—SOLID PANELS @ TOP TO MATCH BOTT. PANEL
EXISTING STONEWORK TO REMAIN
RAISE EXISTING STONE WALL BOTH SIDES OF ENTRY AS SHOWN—MATCH EXISTING STONE
1'-5"±
ENTRY ELEVATION (SOUTH WEST)
REINFORCE CENTER STILES WITH 2" x 2" x 3/16" STL. ANGLES FLUSH
RELOCATE ASTRAGAL AS REQUIRED
8"
ALIGN TOP OF STONE CAP WITH BOTTOM OF STONE JOINT
RECENTER EXISTING TRIM ADD CENTER TRIM PIECE
EXISTING STONE MASONRY (MATCH NEW TO EXISTING)
STILE DETAIL
WALL ELEVATION

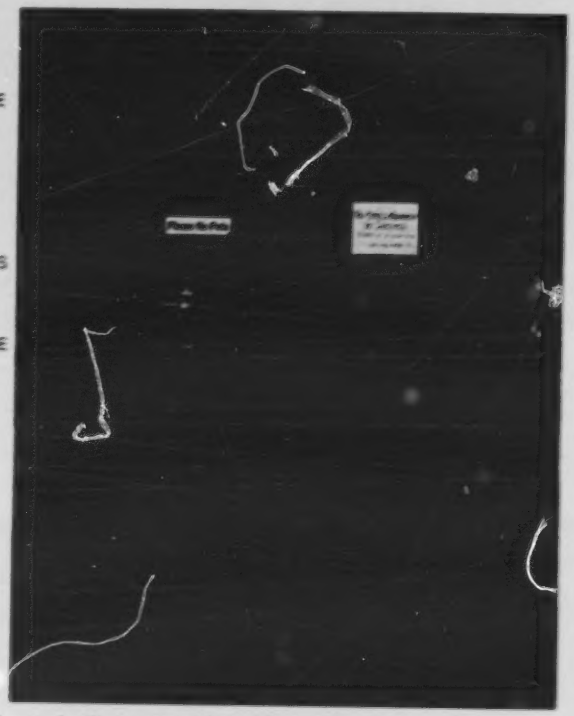


Fig. 12 Rather than replace existing ornamental doors, the University of Colorado came up with a plan to widen one of two leaves of the double door at the Hale Science Building. One door was reduced in width and the other enlarged by the same amount – sufficient to provide 32-inch clearance; the molding was then recentered and replaced. The photo above shows the completed modification.

22

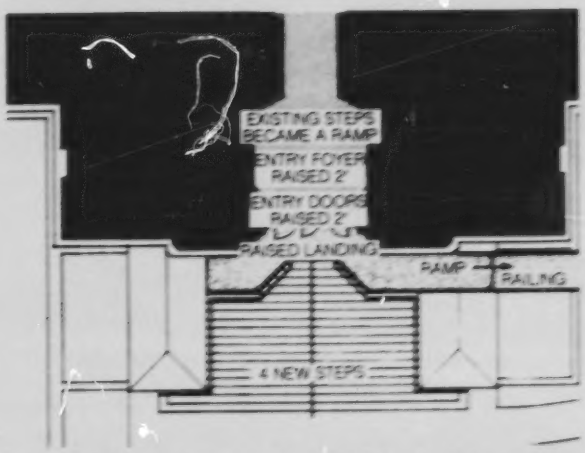


Fig. 13. Modifications are scheduled for the classic inaccessible facade of the Texas Memorial Museum at the University of Texas at Austin. A site bridge will provide access to a raised landing at the museum. Raised entry doors, a foyer floor filled in to a depth of two feet and an interior ramp will complete the project. Note the compatibility of the handrail on the bridge with the existing railings, and the balanced treatment of both the steps and railing at each side of the door.

a compatible style. Others are installing automatic powered doors, as at West Virginia University's Main Library, Franklin & Marshall's Stahr Hall and the University of Texas' Hogg Memorial Auditorium (Fig. 11).

At the University of Colorado, the ornamental double-leaf oak doors at the entrance to the Hale Science Center did not provide the necessary 32-inch clearance for a single leaf. The trim molding on the latch edge of each leaf was removed and reinstalled two inches back from the latch edges. The left door leaf was narrowed by the exposed two inches, and the right door leaf was widened by the same amount. The result: the door retains its original molding and apparent proportions but provides the necessary clearance through the right door (Fig. 12).

Creating Accessible Entry Foyers

Sunken entry foyers, or foyers opening on short flights of steps, may be dealt with by raising the foyer floor if ramps or wheelchair lifts are not feasible. The University of Texas at Austin has developed an alteration plan for the Texas Memorial Museum (Fig. 13) that will link an exterior bridge and raised landing with a raised foyer floor to provide access. Cornell University's Willard Straight Hall, the main student union building (Fig. 14), has been made accessible by a similar scheme. At Memphis State University, an entrance door to Jones Hall (Fig. 15) was raised in order to allow for the construction of a ramp that begins outside, where it overcomes exterior grade changes, and continues inside the building to eliminate a set of interior steps.

Providing Alternative Solutions

On occasion an inaccessible building entrance can be bypassed rather than altered. Bridges, generally covered to provide protection from the weather, are used by a number of campuses to provide access from an accessible building to an older building with entrance barriers. Tunnels and shared elevator towers are other means of providing access through building links. At the University of Delawate, covered pedestrian bridges link up with elevators to overcome barriers (Fig. 16).

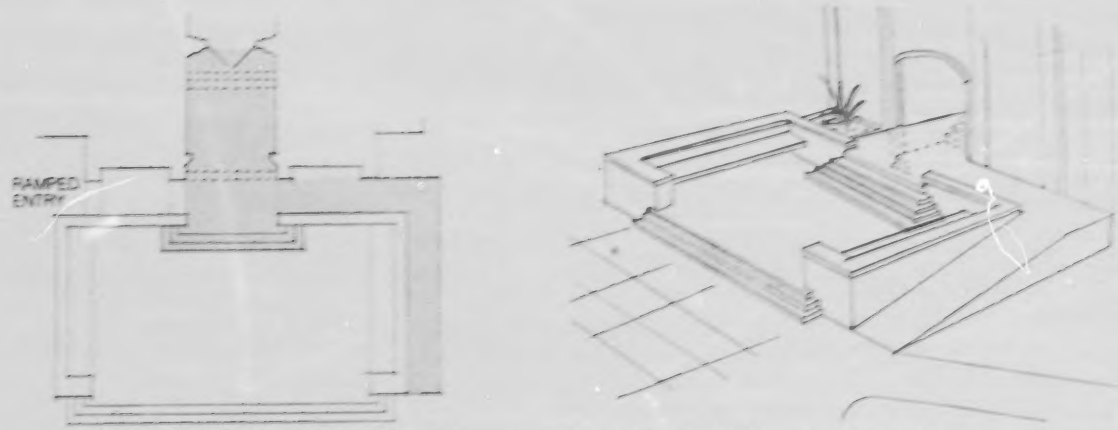


Fig. 14. A similar project at Cornell University's Willard Straight Hall is making that building, the campus' main student union, accessible.

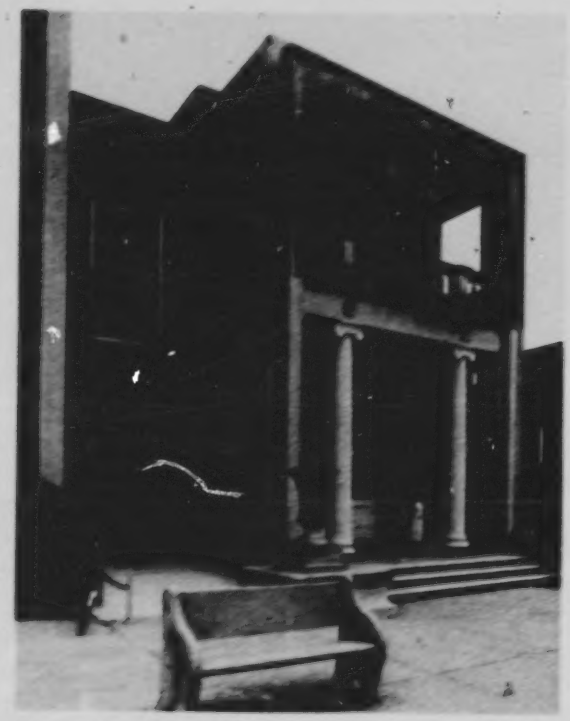


Fig. 15 Jones Hall at Memphis State University had steps both outside and inside. Raising the door to the left of the portico allowed a ramp with gradual slope to begin outside the door and continue into the hallway to eliminate interior and exterior steps.

Constructing a new entrance is another approach. At Sioux Falls College, a former fire escape at the end of a first-floor corridor is being converted to an accessible entrance at an estimated cost of $5,000. On the University of Wisconsin campus, the 25-year-old Commerce Building was given an accessible entrance by converting the central group of three sets of windows into a major doorway. Indiana University of Pennsylvania is solving the access problem in their major restoration project, the 104-year-old Victorian style Sutton Hall, by remodeling an existing grade level entrance (Fig. 17). A retaining wall will be moved, the entrance enlarged, and the interior floor plan changed to provide access to the first floor and the building's elevator.

Getting Around

Once the problem of entering an older building is overcome, the next barrier is often that of changes in floor level in the interior. Frequently, these changes result from additions or alterations to the building over time; often, they are part of the original design, as in the common Gothic architectural device of entry foyers with steps leading to raised corridors.

Interior ramps can provide a transition from one level to another where space permits. Lansing Community College found that to be the solution for the former Old Central High School, now a college building. Built in 1875, the structure had undergone numerous alterations and additions in the course of its history and has several level changes on the first floor that were ramped for access.

Where space for ramps with a suitable slope is not available, some schools are installing wheelchair lifts. The Student Union Building at Michigan State University, built in British Renaissance Style in 1925 and expanded in 1948 and 1966, is installing lifts on both the third and fourth floors. Pennsylvania State University is also planning wheelchair lift installations in Waring Hall as part of the accessibility modification program for that building.

Moving Up

Vertical access between floors of buildings is generally achieved by installing elevators. Many colleges and universities have added new elevators to old buildings for that purpose. Where space permits, this has usually been done for an expenditure between $100,000 and $150,000. Since an elevator provides easy and safe movement for all users of the building, it is an expenditure that provides a significant benefit for everyone in a multistory building.

In some cases, older buildings are equipped with existing elevators but the equipment is not usable by many handicapped individuals. Manually operated gate closers were reported as a problem in this regard by several campuses. Bowling Green State University, Trinity College, The University of Kansas, and the University of Arizona are retrofitting existing elevators to provide automated controls that will make them fully usable.

An interesting retrofit project was undertaken by the University of Wisconsin in an 1886 building, Science Hall. In 1924, an open cage elevator was installed within the building's stairwell, with ornamental metal work surrounding the elevator shaft. This elevator served the basement through the fourth floor. The original elevator was replaced in 1974 with an automatically controlled cab, and the shaft was fireproofed by inserting metal panels

Fig. 16 At the University of Delaware, covered pedestrian bridges link up with elevators to overcome barriers.

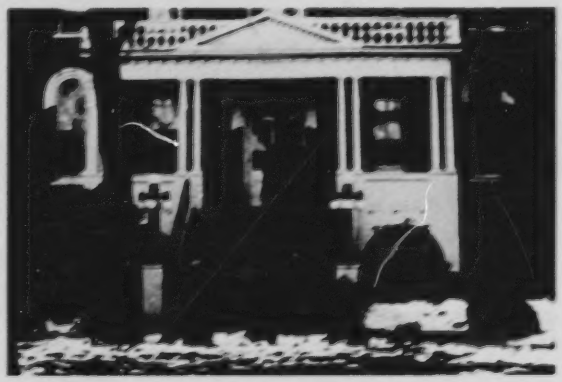
Fig. 17 Indiana University of Pennsylvania's oldest building, Sutton Hall, is being restored. The restoration will include the creation of an accessible entrance, and existing elevators will make the completed project fully accessible. The ground level door on the right (below) will be enlarged and interior changes will be made to provide access to the restored building.

behind the existing woven wire enclosure (Fig. 18). The result is a new elevator that blends almost imperceptibly into its historic setting.

The University of Colorado exhibited similar sensitivity in adding an elevator to the Hale Science Center. Wainscotting and other wood detailing of the building's interior were painstakingly matched on elevator doors and trim.

Rounds Hall, an 1891 building on the campus of Plymouth State College, was made fully accessible with the addition of an elevator during a recent remodeling project. The elevator was installed in the stair tower at the major entrance, which is located midway between the basement and the first floor. Equipped with doors on both sides of the cab, the elevator can be entered from the entrance lobby and allows passengers to exit from the opposite side at each floor level (Fig. 19). Passengers on crutches or in wheelchairs do not have to turn around in order to leave the elevator, an additional convenience factor. Elevator control buttons are equipped with tactile signs using both Braille and standard numbers (Fig. 20).

Space constraints or structural problems sometimes preclude the installation of an interior elevator. Northland College has proposed to overcome this difficulty in the Administration Building by installing an inclined lift that travels up the plane of the stairway. The estimated cost of the proposed installation is $10,000.



Exterior elevator towers are another response to the barrier of interior stairs. A tower can be attached to the existing building, as in Memphis State University's Scates Hall, a women's dormitory built in 1922. The elevator tower was built at a cost of $55,000 and provides a new accessible entrance to the formerly inaccessible building. An exterior elevator tower has also been added to Bailey Hall, built in 1900 on the University of Kansas campus (Fig. 21). Although the main entrance to Bailey Hall is on the ground level, it enters upon the midlanding of the main stairway. Two other entrances provide

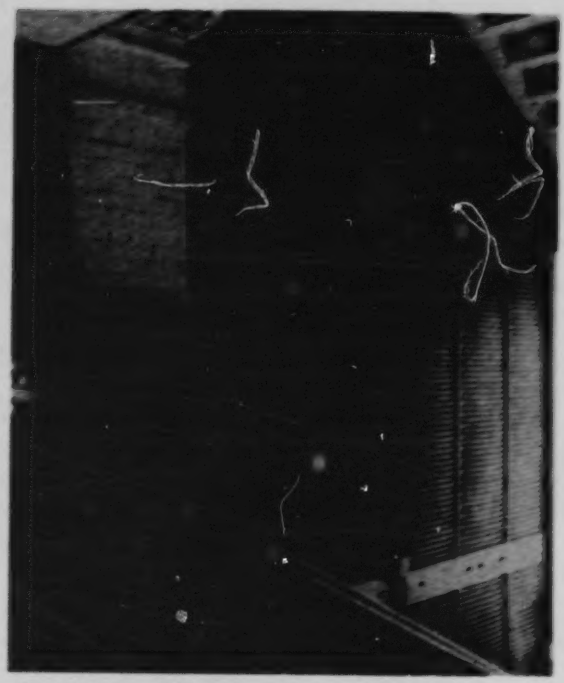


Fig. 18 A new, fully-automated elevator replaced an inaccessible, open-cage elevator in the University of Wisconsin's Science Hall. The existing woven wire enclosure was retained and fireproof material was added to provide a safe and accessible elevator that preserves the original character of the space.

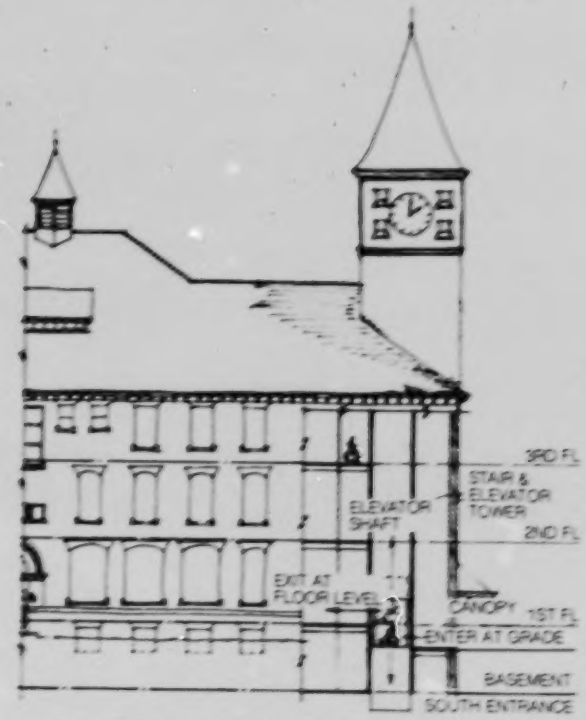


Fig. 19 This elevator at Plymouth State College's Rounds Hall can be entered from the entrance lobby and allows passengers on crutches or on wheelchairs to exit without turning around.

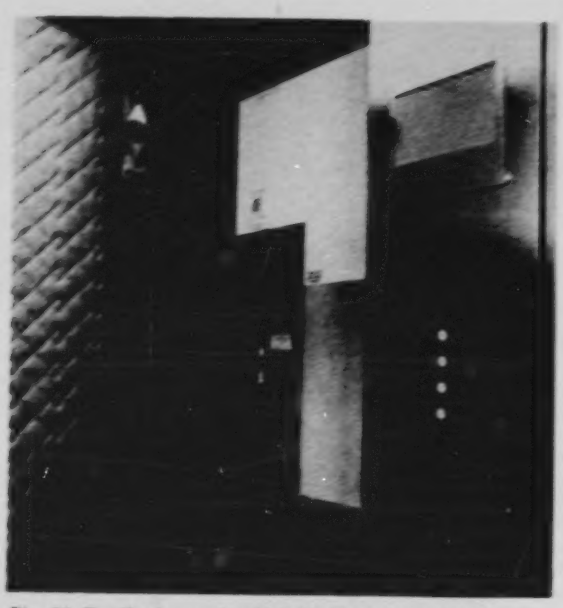


Fig. 20 Tactile signs using both Braille and standard numbers make this elevator in Rounds Hall at Plymouth State College usable by visually impaired people.

ground level access to parts of the lower level, but intermediate sets of steps in the corridor again prevent access to the full level. Because it was not structurally feasible to install an elevator shaft within the building, an elevator tower was constructed at one of the grade-level entrances. Total cost of the project, which included cutting new corridors through interior offices to provide access to the elevator at all levels, was $120,000. Although the fresh surface of the new stone facing is noticeable now, natural weathering of the stone and the growth of vines will eventually blend the new addition into the original building.

Similarly, an elevator tower was constructed in the courtyard of the historic 425 Henry Mall building on the University of Wisconsin campus. A Renaissance Revival building erected in 1913, 425 Henry Mall has been nominated to the National Register of Historic Places.

An exterior tower housing elevators and stairs was built by Iona College to serve Doorley Hall, constructed in 1927. The self-contained tower, separated from the building by fire doors, is also designed to provide a safe emergency exit in the event of fire in Doorley Hall.

Linking Buildings

Connecting old buildings with new structures is another method for providing access to all floors of the older facilities. This may be accomplished by multilevel bridges

Fig. 21 When Bailey Hall (top) was built at The University of Kansas, buildings didn't have elevators. Today Bailey Hall has one, added in an exterior tower at an entrance on the other side of the building (bottom). Although the tower is obvious now, natural weathering will blend the new stone with the old; regrowth of vines removed for the construction project will also help to mask the new addition.

between buildings, by providing a common elevator tower or by physically abutting the two buildings.

Dalhousie University has a campus-wide program of connecting new buildings, all of which are designed for full accessibility, with surrounding older buildings. For example, their new dentistry building, now under construction, will be attached to two previously inaccessible buildings, the pharmacy building and the old dentistry building. Also on this campus, the Life Sciences Centre provides access to the chemistry, arts and administration buildings (Fig. 22). In addition to overcoming barriers in the older buildings, attached facilities benefit all students, faculty and staff by reducing exposure to severe winter weather in traveling between buildings. Fig. 23 shows another example.

Providing Accessible Rest Rooms

Inaccessible rest rooms are a common problem in all existing buildings, and one that is often compounded in structures of an early vintage. Standards in the ratio of rest room facilities to building inhabitants have changed over the course of time, as has the amount of space generally allotted to toilet and lounge areas. Raised floors in rest rooms are another problem sometimes encountered in older structures.

Many campuses report adding new, accessible facilities to old buildings when renovation of existing toilets was not feasible. The University of Texas, in accessibility modifications to the Hogg Memorial Auditorium (Fig. 24) built in 1933, took this approach. Seventy-two seats were removed from the auditorium and the space gained was used to provide wheelchair seating in the auditorium and an accessible rest room on each side of the entrance lobby, adjacent to the new area for spectators using wheelchairs.

St. Cloud University provides another example of a frequent situation in older buildings: not every floor is served by a rest room. In this case, the Riverview Building built in 1911 did not have any toilet facilities on the main floor. An accessible unisex toilet was added at a cost of $500.

Fig. 22 Linking buildings provides access to otherwise inaccessible facilities at Dalhousie University. Attached facilities also reduce exposure to severe winter weather in traveling between buildings.

Fig. 23 This bridge at The University of Alberta links old and new buildings to provide access to both.

An Accessible Drink of Water

A convenient means of getting a drink of water from a wheelchair can be provided by adding a second, accessible drinking fountain to the piping for an existing fountain. The University of Northern Iowa accomplished such an installation in Wright Hall at a cost of $200 (Fig. 25). At Plymouth State College, new accessible fountains were added as part of a total remodeling project in historic Rounds Hall.

Places to Live

Like academic buildings on college campuses, dormitories erected over the years continue in active use even as the residents and the regulations change. Dormitories previously segregated by sex become coed; residential spaces designed for able-bodied persons who can climb stairs to their second- or third-story rooms or who can negotiate the steps down into a sunken lounge area need to accommodate handicapped students as well.

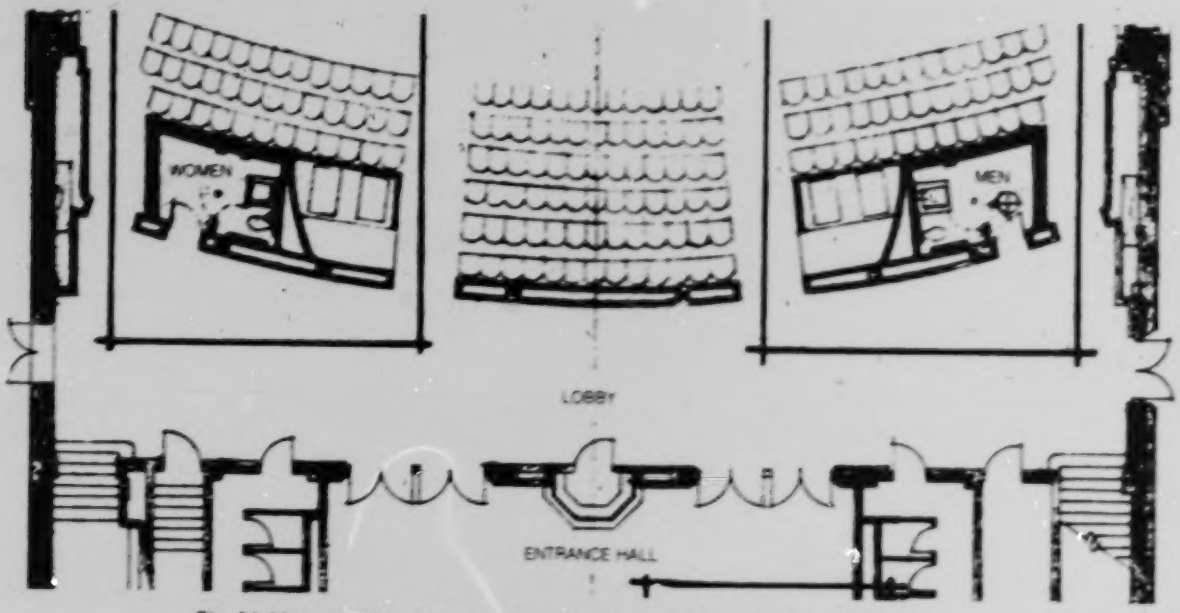


Fig. 24 New accessible toilet rooms were added to the University of Texas' Hogg Memorial Auditorium as part of the modification project that added a wheelchair spectator area to the theater.

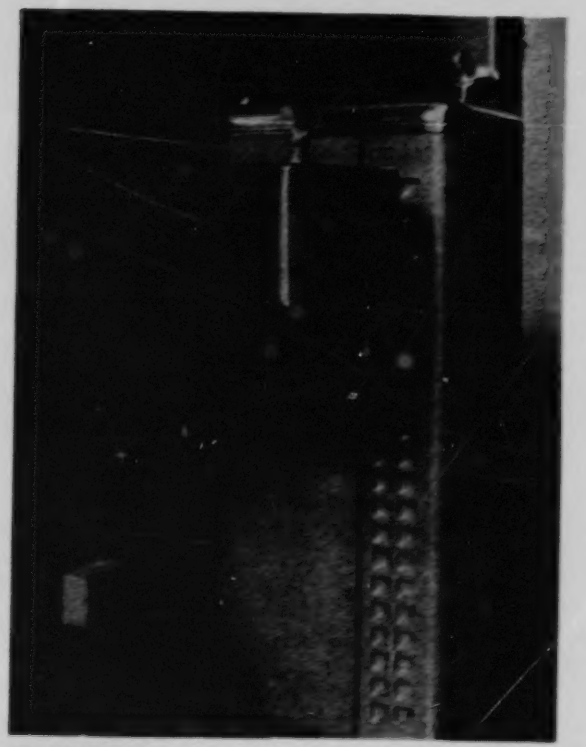


Fig. 25 This accessible drinking foundation was added to the existing fountain in Wright Hall at the University of Northern Iowa.

Adding an elevator makes some buildings, such as Memphis State's Scates Hall, totally usable. Other campuses have taken alternative routes toward providing accessible housing.

At Albion College and Southwestern at Memphis, for example, particular rooms have been remodeled to provide convenient and usable lodging for handicapped students. In both cases rooms selected for remodeling were chosen to ensure access to parking, social and service areas of the buildings, dining facilities and other amenities. Rest rooms and closets were altered to be usable by a resident using a wheelchair, and special furnishings were provided to meet the person's needs.

Renovation of the Albion College dormitory room in Seaton Hall included removal and relocation of the doorway and the installation of a private bath with grab bars. The room selected for alteration is located at a ground-level entrance with an adjacent parking space, on the side of the dormitory that faces the center of the campus and that connects with the Baldwin Dining Hall. The renovation cost, including finishing work, carpet and the accessible parking space, was $7,428.

Southwestern at Memphis has modified rooms in Bellingrath and Ellett Halls, both within the campus Historic District. Total cost of accessibility features in both dorms was $8,307, and included modifications in rest rooms and sleeping rooms, along with interior and exterior ramps as necessary to reach service and social spaces within the halls.

Shoemaker Hall, a coed dorm at St. Cloud University built in 1915, was made accessible by a new addition that provides living space for handicapped students. Al-

Fig. 26 These handsome signs are also planned for utility – the raised lettering can be read tactually by people with impaired vision. The etched copper signs are used throughout Sutton Hall at Indiana University of Pennsylvania.

though the dormitory rooms in the original building are not accessible, common public spaces including the reception area and public rest rooms in the lobby are usable by all. The cost of providing the accessible rest rooms was $3,000.

Signs for Our Time

The accessible building is usable by persons with a variety of handicaps — sight and hearing as well as mobility. A major requirement of an accessible building involves signs and signals. Most campuses are now providing appropriate signage to mark accessible routes, identify elevator controls and provide other necessary information about the environment.

Many campuses, including the University of Arizona and Franklin & Marshall College, included signs and identification as line items for every building when they developed budgets for their modification programs. Franklin & Marshall, in addition to categories for "signage" and "identification," included as a separate item "visual fire signals" to ensure that hearing impaired individuals are alerted to emergencies. According to the budget, these visible alarms cost $40 to $50 each, depending on the number installed in a given building.

In historic buildings, aesthetic considerations should be given weight along with the concern for imparting information to handicapped people. Indiana University of Pennsylvania (Fig. 26) provides examples of signs that meet both goals. In order to save Sutton Hall, the first structure on the campus and one that was slated for demolition by the state, a fundraising campaign was initiated by faculty, staff and students to underwrite the renovation of the building for adaptive use. Donors to this campaign will be recognized on commemorative plaques, fashioned of etched copper with raised lettering and designed to complement the Victorian decor of the building. Identification and information signs throughout the building will be made of the same etched copper with raised letters. These signs can be read easily by individuals with visual handicaps, and at the same time provide a handsome, uniform set of signs that enhance the building's design.

Other examples of attractive signage are shown in Fig. 27 and Fig. 28.

Fig. 27 Attractive signage with raised lettering has been added to buildings at The University of Kansas. This sign, which serves as a room number on the old stone wall of Fowler Hall, consists of acrylic letters on a dark brown acrylic background.

Fig. 28 White plastic letters on a blue plastic background make up this direction sign in a corridor at The University of Kansas.

Programming for Access

While the strategies and programming approaches employed by campuses vary, one point is central to well-thought-out accessibility plans: the institutionalization of the accessibility effort, its incorporation into the fabric of the long-range facilities planning effort.

Several campuses referred to the accessibility projects that were carried out as part of ongoing maintenance or campus improvement programs. For example, the Lansing Community College comprehensive development plan mentioned earlier was not a Section 504 compliance project as such, but reflected the inclusion of accessibility features as one of several objectives of the total program.

Franklin & Marshall College also reported that an extensive, campus-wide landscaping project that has been conducted over the past several years includes routine elimination of steps in walkways and addition of curb cuts as needed.

On many campuses older buildings may be scheduled for future restoration that can include accessibility features at little or no additional cost. At the University of Alberta, temporary modifications (see Fig. 29) are made to such facilities until the major renovation project makes a permanent solution possible. Although the interim solution may entail some compromise with preferred accessibility criteria—such as temporarily using a service entrance to a building—the quality of work and adherence to performance standards are controlled to ensure satisfactory use until improved facilities are available. Such solutions are not desirable if any other options are available, since they may attach a stigma to the handicapped user.

Planning Within Budgetary Constraints

With lack of funds considered a major problem by most campuses, cost-saving strategies employed successfully by various schools are of interest. A number of schools noted that use of in-house staff to implement projects was a significant cost-saving tactic. Heidelberg College reported ramps and grading at entrances to buildings were carried out as part of larger projects using maintenance staff, wherever possible. Indiana University of Pennsylvania follows a similar approach; maintenance personnel are able to provide curb cuts at a cost of $245 each. Iona College reduces costs by using in-house staff to conduct architectural evaluations and prepare plans.

The programming approach of the University of Wisconsin suggests an efficient and cost-effective method for achieving accessibility. Projects are categorized in three ways:

- Barriers that can be removed by relatively simple solutions are carried out using campus minor remodeling or maintenance funds.
- Every building addition or major remodeling project includes accessibility items as part of the work.
- Projects not falling into the first two categories are, wherever possible, consolidated into one major project encompassing accessibility modifications to a group of buildings. This enables the project to be developed as a coordinated program using a single consultant with state and University staff. One such project currently underway groups six older buildings for accessibility and safety alterations, with a total budget of $1,627,000.

Working Within Historic Preservation Plans

Many campuses today have portions of their physical plant and grounds designated as Historic Districts. Gallaudet College, Tuskegee Institute, Southwestern at Memphis and the University of Wisconsin are among those that have such areas recognized by the National Register of Historic Places. In each case, accessibility modifications have been carried out on buildings within those districts.

Even more common than the Historic District is the officially recognized individual historic building on campus. Campus interest in preserving these buildings is high, as exemplified by restoration and adaptive use campaigns carried out by Syracuse University and Indiana University of Pennsylvania, among others.

The University of Wisconsin reported a campus-wide historic preservation plan. Three historic districts have been designated on the campus, and buildings within each district are evaluated according to historic and architectural significance. Buildings may be assigned one of four priority ratings. First priority indicates those buildings possessing a high degree of architectural or historical integrity and whose retention is essential; second priority identifies those buildings possessing a strong degree of integrity and whose retention is highly desirable. Modifications or additions to second-priority buildings are to be undertaken only after careful study so that any visible effects will not adversely affect their character. Buildings assigned third priority are recognized as adding to the sense of unity of the campus, without necessarily possessing on their own merits that high degree of architectural

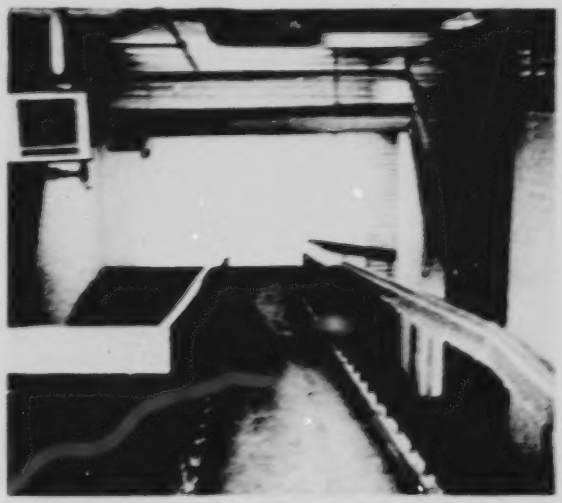


Fig. 29 This is a temporary ramp in the Arts Building at the University of Alberta. Although the building is scheduled for major renovation in 1981 and front-door accessibility will be included in that project, the University in the meantime installed this well-built ramp at the only accessible entrance. The use of handsome wood handrails and carpeting of the area softens the impact of having to use a service entrance for a few more months.

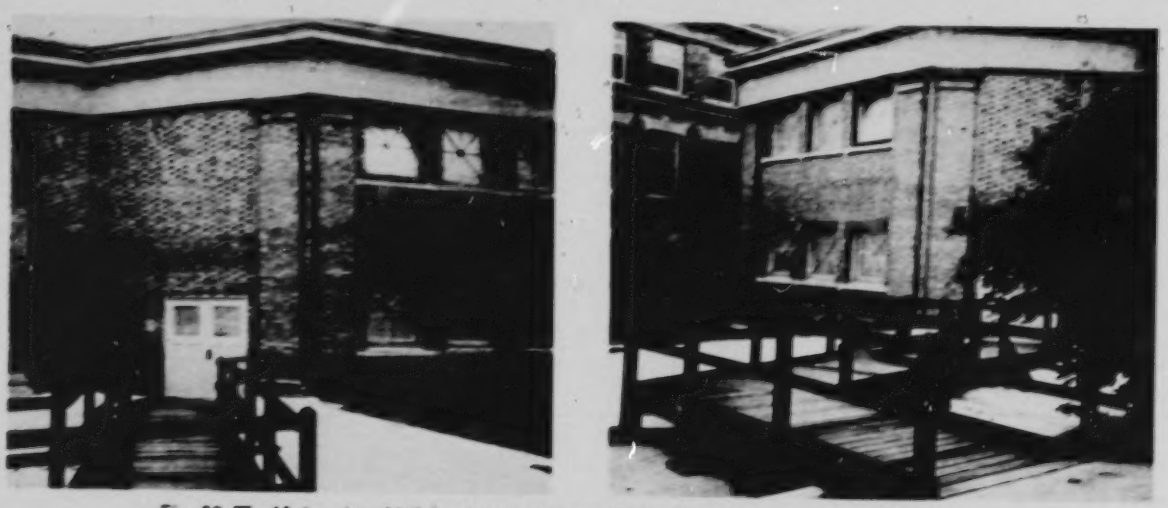


Fig. 30 The University of Wisconsin's Agriculture Hall, designated as second-level historic priority, has a major lecture hall located at mid-level between the first and second floors. Access is provided by a site bridge leading to an exterior door to the lecture hall.

or historical value that warrants an individual designation. Fourth priority designates those buildings whose individual merit cannot be considered of high value or, in some cases, where the construction period is so recent as to render an evaluation of architectural value premature.

Simultaneously, the University has been planning for preservation of these buildings and making accessibility modifications to ensure their continued usability for all the campus population. Among those modified buildings having first priority for preservation are Bascom Hall, the oldest structure on campus, a Renaissance Revival building constructed between 1850 and 1857. Modifications to this building include the preparation of an accessible entrance to the McBurney Center for Handicapped Students, one of several offices located in this historic structure.

425 Henry Mall, built in the Renaissance Revival style in 1913, is also a first-priority building. As noted earlier, an elevator tower has been added to this building.

Among second-priority buildings that have been altered to achieve accessibility are two Beaux Arts structures, the Agriculture Hall built in 1900 (Fig. 30) and the Agriculture Journalism Building erected in 1907.

On other campuses, adaptive use of historic buildings has resulted in preservation of the exterior and complete renovation of the interior. Syracuse University recently dedicated its renovated Hall of Languages, called the "symbol of the academic heritage of Syracuse University." The building, erected in 1873, was the original classroom structure on the campus and was in continuous use until its renovation and reopening in 1979.

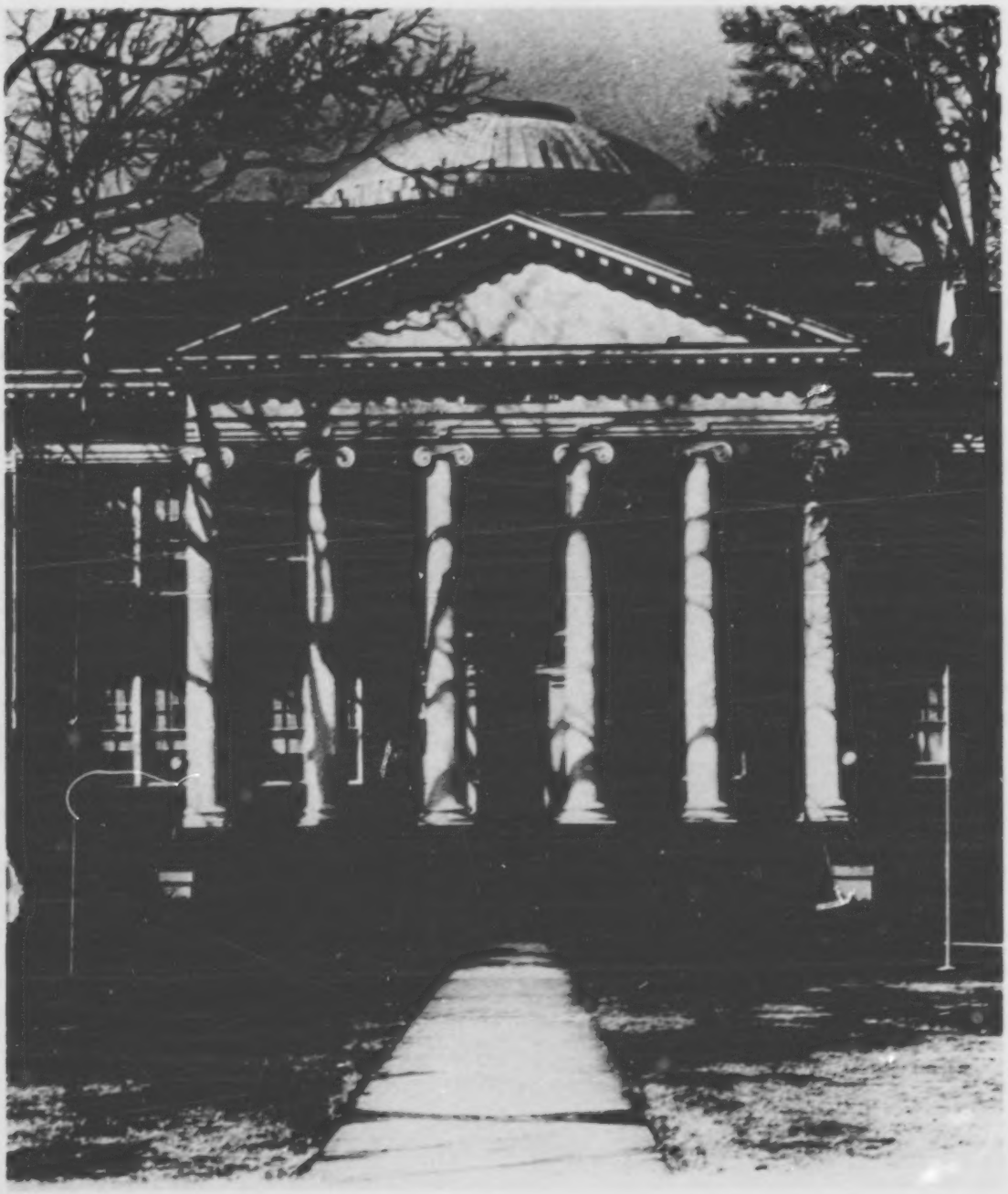
The exterior of the building was repaired and restored, and the interior remodeled. An elevator and grade-level entrances on the parking lot side make the newly remodeled structure fully accessible.

Tuskegee Institute reported a similar project on Carnegie Hall, built in 1901. The old interior was remodeled and an elevator added. A ramp at the front entrance completed the accessibility requirements for the structure.

The approach to be taken in continuing the useful life of a campus building will depend upon the nature of the building itself and the established institutional policy on historic preservation. However, it is clear from many campuses' experiences that accessibility can be achieved within the context of respect for historic buildings.

PART 2

Creating New Approaches to Access: Six Design Studies



Introduction

34

Bringing the fresh eye of creativity to the challenge of making historic buildings accessible offers the best hope of developing innovative approaches to the problem. With that objective in mind, six schools of architecture successfully completed design studies for accessibility modifications to actual historic or significant older buildings on their campuses.

Design projects were conducted at Clemson University, Iowa State University, Kansas State University, University of California/Berkeley, University of Colorado and University of Notre Dame.

Typical Problems

A total of seven buildings have been the subject of detailed examination by teams of students of architecture. The range of problems the students identified illustrates the listing of problems in Chapter Four.

Seven principal features were revealed as problems in one or more of the seven buildings. Two features—steps at entrances and inaccessible toilets—were common to all buildings under study. In most cases, the entrance steps were monumental stairs that constitute a dominating element in the architectural design.

A lack of elevators is shared by six of the buildings. Next in order of frequency of occurrence are changes of level within a given floor. Most often, these level changes occurred as the result of stages of construction over the years, as buildings were expanded and remodeled for new functions. In Iowa State's Morrill Hall, floors in the 1890s building have changes in level as great as two inches as a result both of settling on the foundation and of installation of different flooring finishes over the years.

A second example of this problem is North Gate Hall, the study project for the University of California/Berkeley team, which has twelve changes of level within a two-story building (Fig. 31). The original structure of two floors has had three major expansions over the course of its 73-year history. Initially, the original two-story building was expanded with a one-story wing built up the slope of a hillside, resulting in four changes of level in the corridor and one grade change between connecting

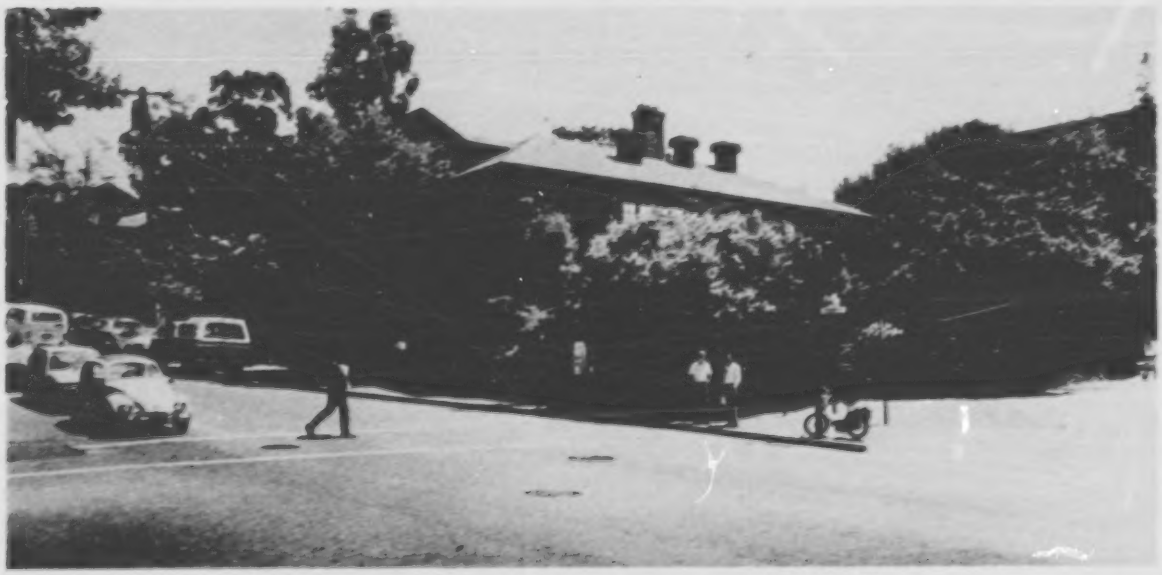


Fig. 31 Rising roof lines show North Gate Hall's progression up the hillside. The one-story addition pictured here has five sets of steps in its corridor to accommodate the slope of the hill. Design Study 4 recommends accessibility modifications to overcome these and other barriers.

Fig. 32 Two design teams discovered obstacles to visually impaired persons. A visually handicapped person could venture onto the broad stepped cheekwall (left) before realizing that the corridor floor had given way to a staircase. This wall-hung display case projecting into the corridor (right) could also be hazardous.

rooms. Later a second two-story wing was added to this addition, and finally a third two-story section was constructed opposite the first wing, creating a courtyard.

Another problem specifically noted by both the Kansas State University and the University of California/Berkeley teams was the presence of hazards to visually impaired individuals. The stairway design in North Gate Hall on the Berkeley campus is such that a blind individual could walk onto the broad stepped cheekwalls of the stair without realizing the situation (Fig. 32). Wall display cases projecting into corridor space in Dickens Hall on the Kansas State campus (Fig. 32) present a potentially hazardous obstacle that would not be detectable by the long cane technique used by most blind people.

Both Iowa State University and Kansas State University faced a common problem in their buildings: an entry foyer opening on a full flight of stairs. Lack of space for a ramp posed another difficulty for Iowa State in planning modifications to Morrill Hall. The site does not provide sufficient room for a ramp to compensate for the steps at the entrance that is nominally the principal entry to the building (Fig. 33).

This section details the proposed modifications developed by the student teams for the buildings under study on their own campuses. Most of the student teams developed a set of objectives at the outset of their projects. Common to all their statements were such points as:

- making the building accessible to all users — able-bodied and temporarily handicapped persons as well as individuals with permanent handicaps of all types.
- achieving accessibility without special or separate provision for handicapped persons to the greatest extent possible.
- integrating accessibility modifications into the historic fabric of the building without impairing its architectural integrity, by choosing design alternatives that are compatible in size, scale, materials, color and character with the building.
- providing permanent solutions to accessibility problems in a cost-efficient manner.
- promoting a safe and secure environment for all users.

The solutions present a number of innovative ways to overcome these barriers, suggesting alternative possibilities where typical approaches are not feasible, either in terms of cost, appropriate design or constraints imposed by site or structure.

The Design Studies

Each school of architecture selected a student team to work on a design study for a particular building on its campus. Each design study section contains a description of the building studied, a listing of the accessibility problems noted by the design team and a recommended solution to these problems. The descriptions of the recommended solutions all address eight specific aspects of accessibility that contribute to a total system of access. This will enable readers to review a variety of possible solutions to a number of types of access problems. Each design study addresses the following eight elements:

1. site access
2. an accessible entrance
3. vertical access
4. horizontal circulation
5. toilet rooms
6. drinking fountains
7. signage
8. special spaces

Some campus design teams addressed other problems in developing their recommended design solutions. These concerns are listed as a ninth category, "Additional Program Concepts."

Fig. 33 There is no room for a ramp at the entrance to Morrill Hall, and even if there were . . .

. . . there are two doors off the entry vestibule. The door to the left opens onto this vista . . .

A Technical Study Group consisting of three architects reviewed the proposed design solutions. An Advisory Committee also reviewed the proposed solutions. Their comments and suggestions for alternative solutions are contained in the section on "Technical Study Group Comments." This section provides a perspective on the proposed solutions that may help readers who are looking for ideas for possible solutions to similar problems on their campuses.

These projects illustrate that many approaches can be taken when developing design solutions to make older buildings accessible. The multiplicity of codes and standards in force across the nation makes it impossible to ensure that the projects discussed here would meet standards in every locality, or would be acceptable to the Advisory Council on Historic Preservation for projects under their jurisdiction. Where there is no uniform set of standards and guidelines, there can be no uniform evaluation of appropriateness. Rather, the accessibility modification proposals reported in the sections that follow were selected because they represent actual projects in which the planners have exhibited their commitment to melding the concerns of historic preservation and accessibility.

The variety of approaches testifies to the fact that there is no one answer. Each project is an individualized approach to a unique building. Indeed, the value of the examples presented here lies in their variety. The possibilities for appropriate modifications are limited only by the creativity of the planners involved, working within the context of laws and regulations.

At least one conclusion can be drawn from the results of these design studies. Access can be achieved in older buildings without compromising architectural integrity or sacrificing the dignity of handicapped users.

. . . and the other entrance leads to an equally difficult barrier. The Iowa State University Design Team addressed this problem in Design Study 2.

DESIGN STUDY 1

Developing An Accessible Physical Education Facility: Clemson University

The Building

The original portion of Fike Recreation Center is among a group of buildings designed by Rudolph Lee, founder and first dean of the College of Architecture at what was, in 1889, Clemson College. These buildings are valued on the campus as typifying a particular period of growth for Clemson. The building today (Fig. 34) consists of two distinct parts — the original portion that was constructed in three stages over a period of seven years and the south addition, which includes the pool and was completed in 1975.

Originally known as the Fike Field House, the earlier sections of the structure were built during an expansion program at Clemson that began just before the Great Depression. The first portion is the north office block, which was built in 1927 and remains intact as it was originally designed. Also considered part of the original portion are the west gymnasium, built in 1932, and the east gymnasium, which was added in 1934.

In 1975, when the south addition was constructed, the main student entrance shifted from the original north elevation (Fig. 34) to the new ground floor lobby on the west. With the exception of the third floor level, which is now used for temporary student housing, the north office block connects with the south addition at all levels.

The original building is a brick structure with simple symmetrical massing, Tuscan motifs and a clay tile hip roof. The office block was constructed with masonry load-bearing walls, while both gymnasiums are point-bearing on piers with roof trusses. The structural system consists of prestressed concrete beams supported on columns.

Fike has traditionally been the center of athletic programs for the University. Today it houses the University collection of athletic trophies in the original north office block.

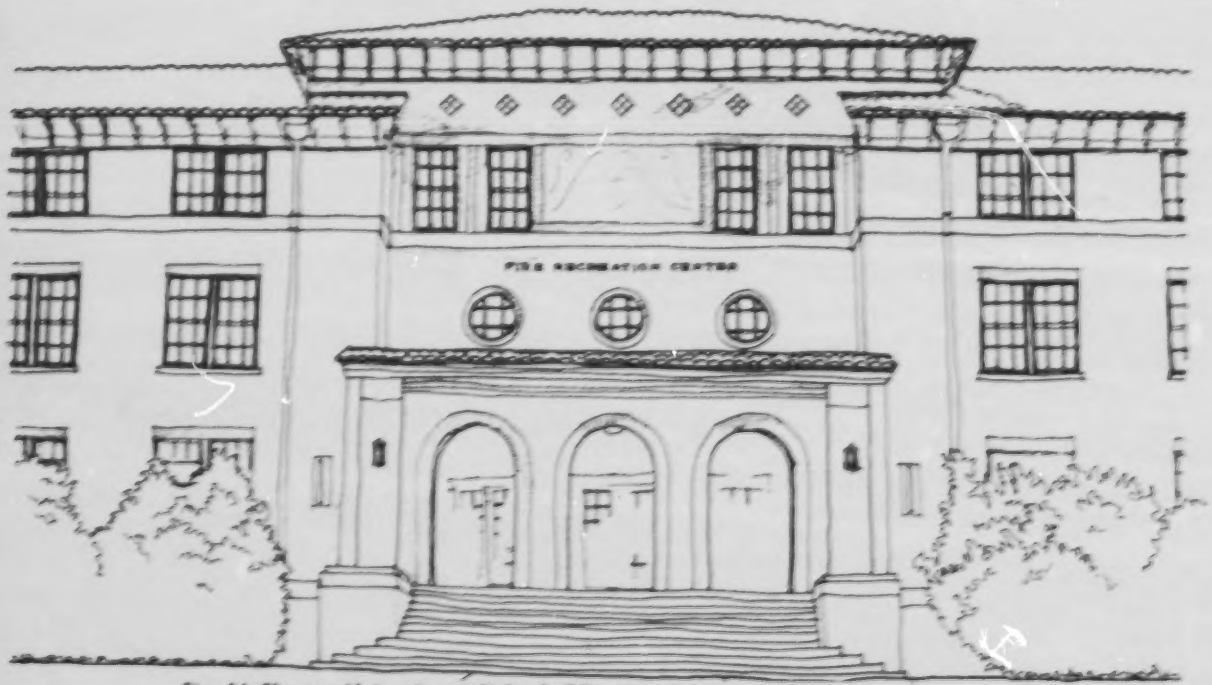


Fig. 34 Clemson University student building containing gymnasium, natatorium and office facilities, Fike Recreation Center.

38

The Problem

Fike Recreation Center contains three main floor levels levels served by a large passenger elevator that was installed in the 1975 addition. However, because of the spatial requirements of the variety of sports that were included in the building program, the slope of the site and a limited budget, some compromises were made in the 1975 addition that resulted in accessibility problems. Thus, although the facility does not have the vertical access problem typically found in older buildings, horizontal access to split-floor levels is severely limited on the ground floor.

Although the main entrance and lobby are accessible, the ground floor has no accessible toilet rooms or showers. All locker rooms are inaccessible due to a series of steps in the main corridor. In addition, there are steps between the men's locker room and both the large gymnasium and a second men's locker room. The corridor steps also prevent access to the women's lockers. Within the locker rooms there are no dressing spaces usable by an individual in a wheelchair.

Ramps now lead from the men's and women's locker rooms to the pool area, but they are too steep for independent mobility and are frequently wet. Handball courts are also inaccessible, as is the terrace from the ground level.

The elevator provides access to the first floor, with its multipurpose activity area, wrestling rooms and spectator area for the pool. Seating for handicapped spectators was included in the original design for this area. Thus here and on the partial second floor, the major accessibility problems are the toilets and drinking fountains. In addition, the first floor handball courts are not accessible due to narrow doors.

The Recommended Solution

Major changes will be required on the ground floor, as described in the program plan. A system of ramps and a wheelchair lift would form an accessible route of travel. Other building elements, including toilets, drinking fountains and doors, would be modified as necessary to create an accessible, usable environment.

Components of the solution are:

1. **Site access** would be achieved by reserving parking spaces for handicapped people adjacent to the ground floor entrance (Fig. 35).

2. **The accessible entrance** would continue to be the ground floor entry, which is already accessible and serves as the major student entrance (see Fig. 37).

3. **Vertical access** would be achieved using the existing elevator (see Fig. 37). This elevator links all floors of the

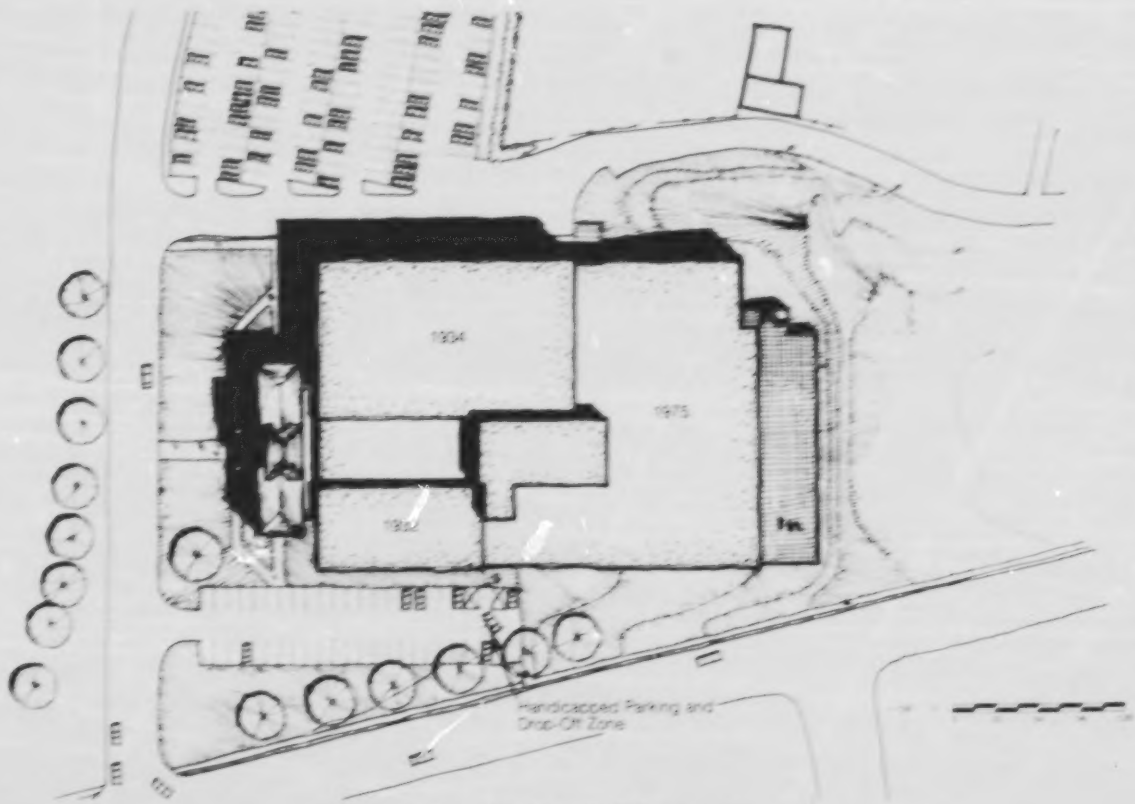


Fig. 35 Existing Site Plan: Fike Recreation Center

new addition and through level connections provides access to the historic north office block's first two floors, which house the public areas of that structure. Existing stairs would be modified and new stairs would be designed to meet accessibility standards for handrails and closed risers without projecting nosings.

4. Horizontal circulation would be provided with a system of ramps and a wheelchair lift (Figs. 37, 38 and 39). In constructing the major new ramp system on the ground floor, some existing stairs would be removed and relocated. A new ramp system would also be installed leading to the pool area (Fig. 38). This ramp would be supplemented by steps to provide an alternate route to the long run for those who find ramps difficult or undesirable to use. With access to the pool deck, it would also be possible for handicapped individuals to reach the terrace at this level.

5. Toilet rooms would be modified throughout the building. In accordance with state law, one public toilet room for each sex on each floor would have an accessible toilet stall and fixtures. Locker room toilets would also be modified.

6. Drinking fountains would be altered for usability.

7. Signage was not covered by this project.

Fig. 36 Entrance steps and changes of level in the main corridor of Fike make the locker rooms, pool and some activity spaces inaccessible.

8. Special spaces

- *Locker rooms* would include dressing spaces that provide necessary clearances for handicapped individuals. Details of an earlier student design for special dressing areas (Fig. 41) are also of interest. In this scheme, padded dressing tables are provided for individuals with artificial limbs, and curtains are installed on tracks for those who prefer privacy. Each locker room would be equipped with one such area.

- *Shower stalls* would be altered for usability and would include a built-in seat.

- *The pool* would be made usable by the installation of a lift.

- *The gymnasia, wrestling room and all other special activity spaces* are accessible for both participation and spectator use. Wider doors would allow access to the handball courts.

9. Additional program concepts

Although not included under the scope of this project, the student team proposed that future planning consider the concept of developing old Fike Field House as a center for special services for handicapped people. This portion of the building, they noted, contains ample accessible space that could be utilized in a variety of creative ways. Options might include providing separate locker rooms for handicapped students who preferred privacy, or installing physical therapy facilities. The old main lobby, now unused, would provide immediately available space that could be used effectively for these or other purposes, any one of which would be a valuable addition to facilities for handicapped members of the campus community.

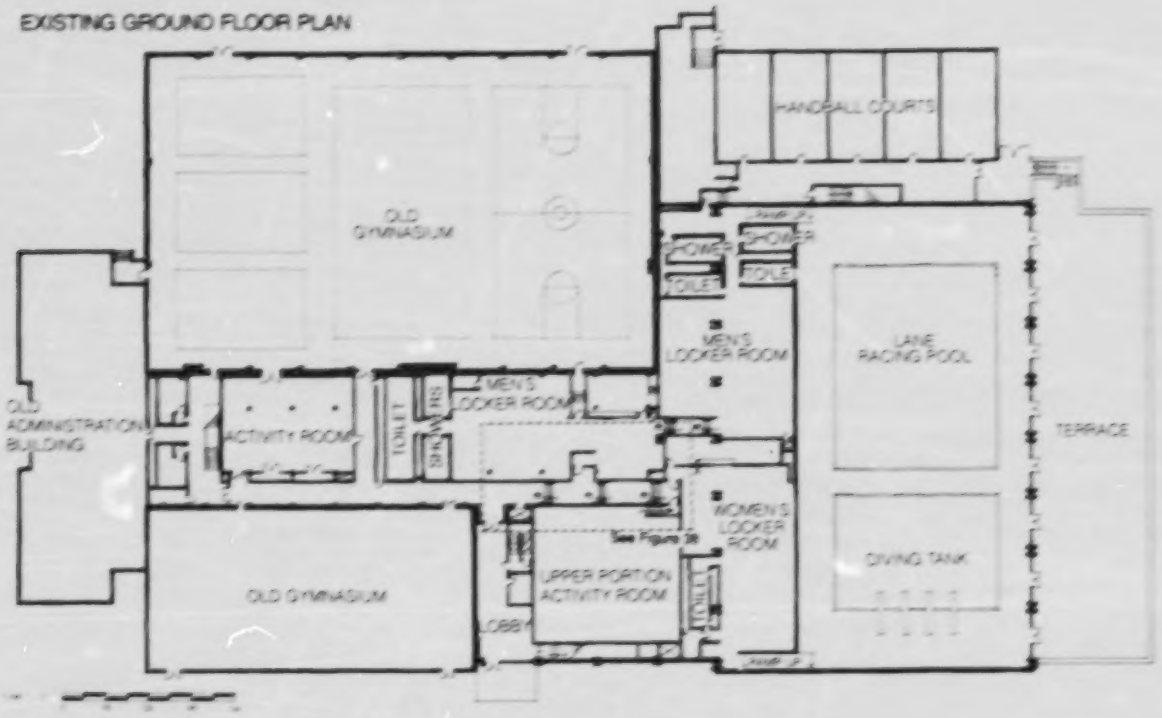
Technical Study Group Comments

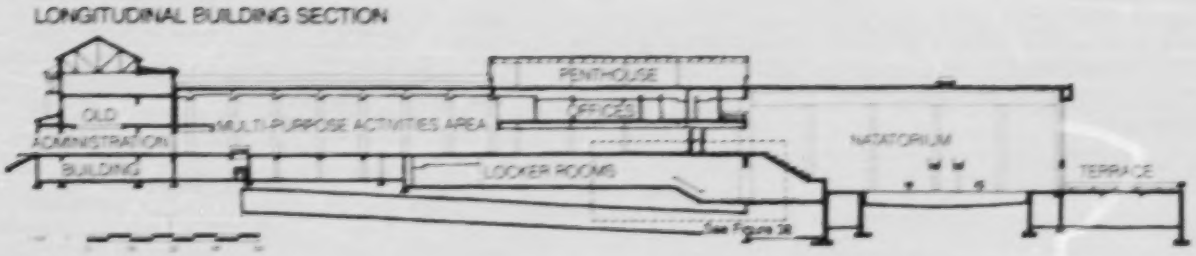
The proposed design solution creates an integrated system of accessibility for the building, beginning with the reserved parking spaces at the entrance and reaching all activity spaces within the structure. Handicapped users of the facility would have access to all the resources available within the building. They would also be able to reach the public areas of the original north building via the major circulation routes that all students use. It is, agreed the Technical Study Group, a clean and simple solution.

In reviewing this project, the Advisory Committee pointed out that the south addition should have been designed for barrier-free access in order to comply with statutory requirements in effect at the time of its construction. Legislation mandating barrier-free design has been in force in South Carolina since 1963.

Although the Technical Study Group initially felt that this solution did not totally address the issue of site access to the facility, it recognized that the remoteness of the Fike Recreation Center from the main campus probably requires that handicapped people use a vehicle to reach it. Reviewers suggested that a passenger drop-off zone be designated in addition to the parking spaces reserved for handicapped individuals. They also recommended the development of an accessible pedestrian path around the building.

The group discussed the fact that the original, and architecturally more significant, entrance was not made accessible. Several factors argue for the approach taken:





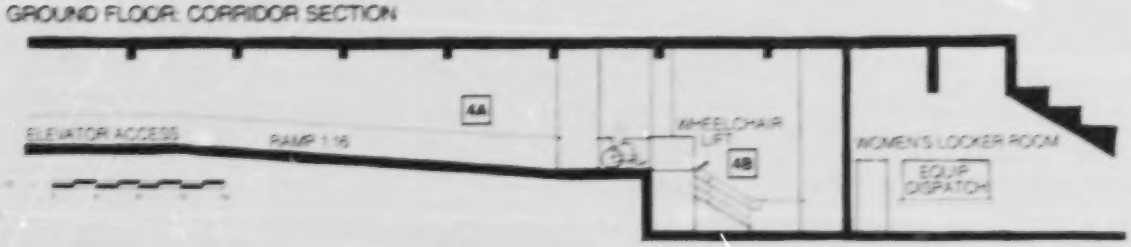
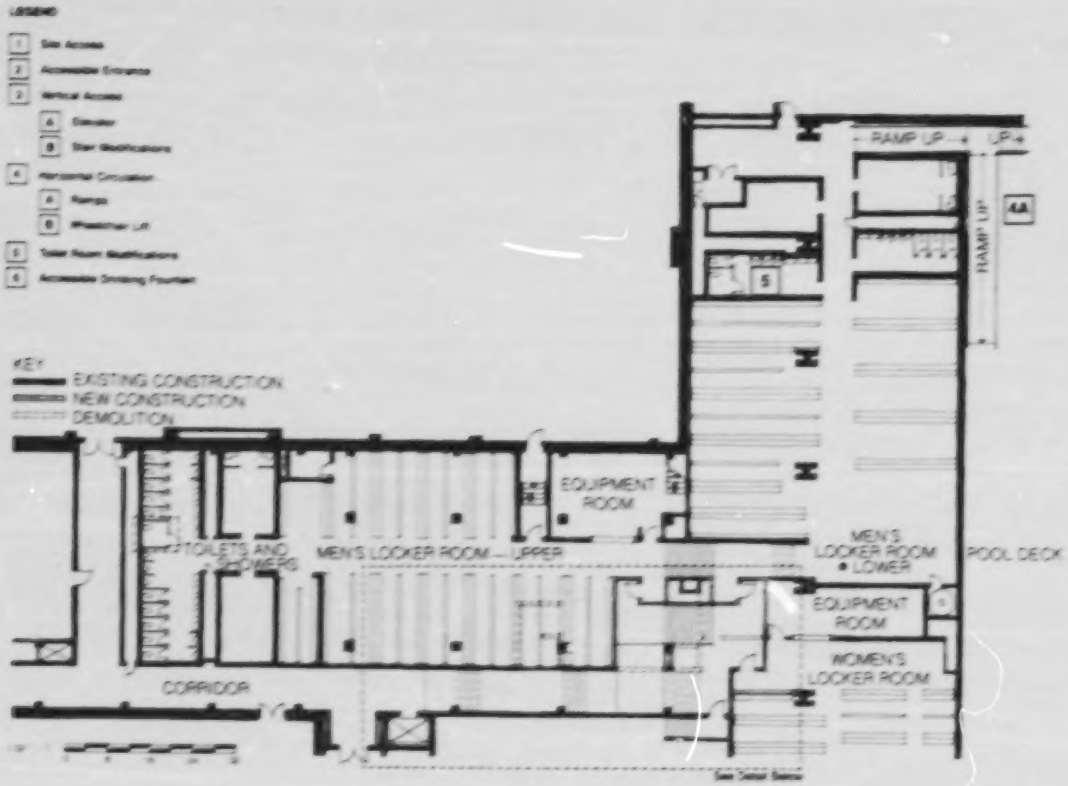


Fig. 37 The existing elevator in Fike Recreation Center provides access to upper floors, but the changing levels of the locker room corridor on the ground floor make locker rooms and some activity spaces inaccessible. Existing ramps in the pool are inaccessible because they are too steep and not slip-resistant. The existing ground floor plan and the longitudinal building section illustrate the existing situation, and the partial ground floor corridor section shows a proposed ramp and wheelchair lift designed to overcome the problems.

PARTIAL GROUND FLOOR: DEMOLITION/NEW CONSTRUCTION



PARTIAL GROUND FLOOR: IMPROVED ACCESSIBILITY

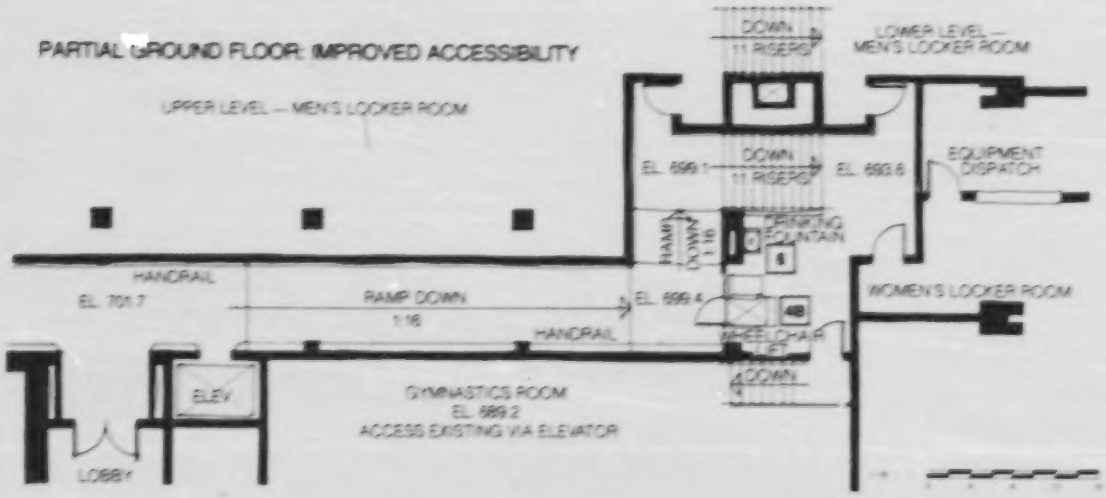


Fig. 38 A proposed ramp for access to the pool area is shown on the partial ground floor plan (top). The area proposed for demolition and new construction is also outlined on the top drawing. The bottom drawing shows proposed accessibility modifications to that area.

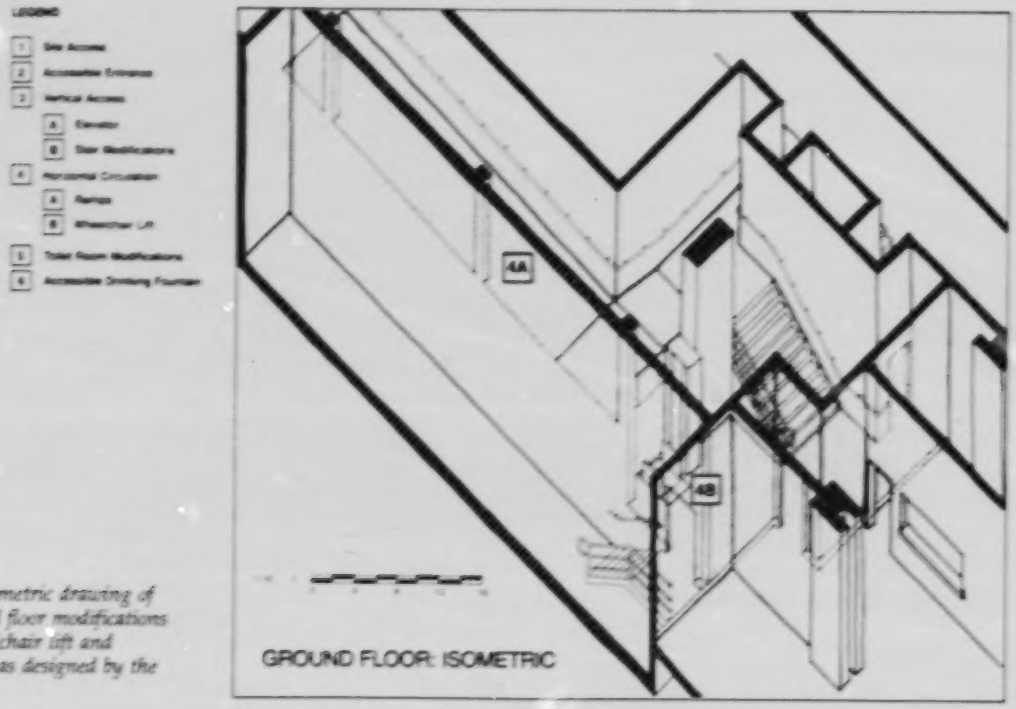


Fig. 39 This isometric drawing of proposed ground floor modifications shows the wheelchair lift and corridor ramps, as designed by the student team.

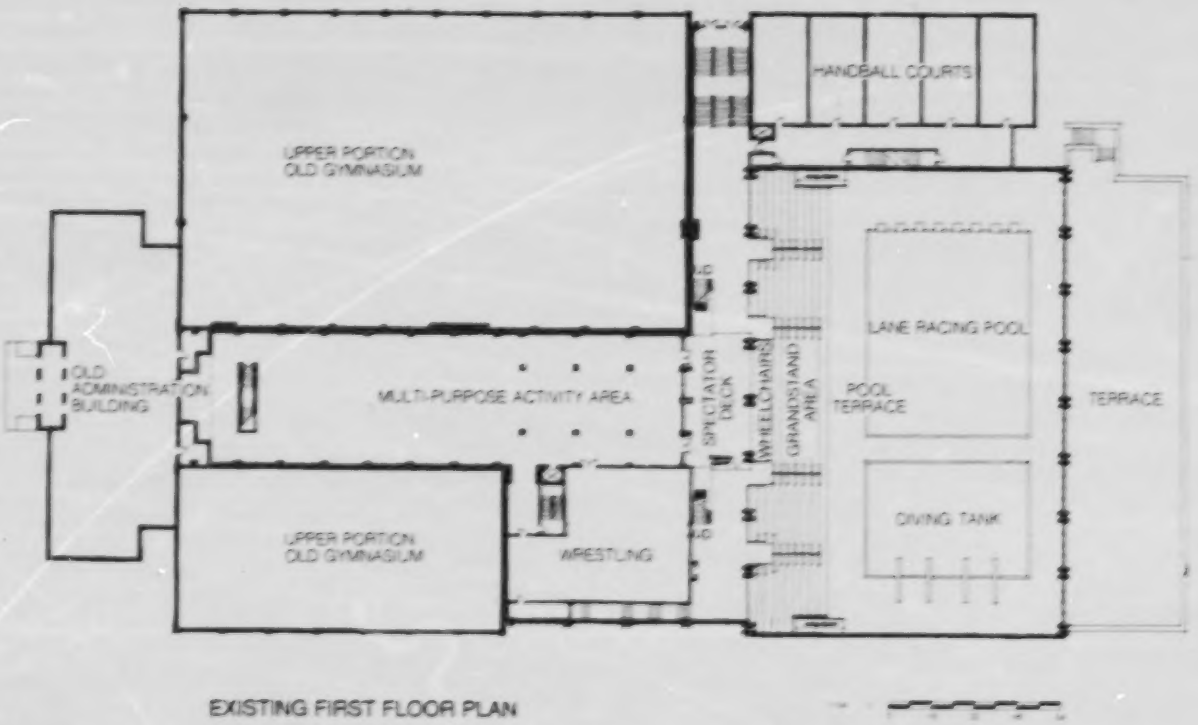


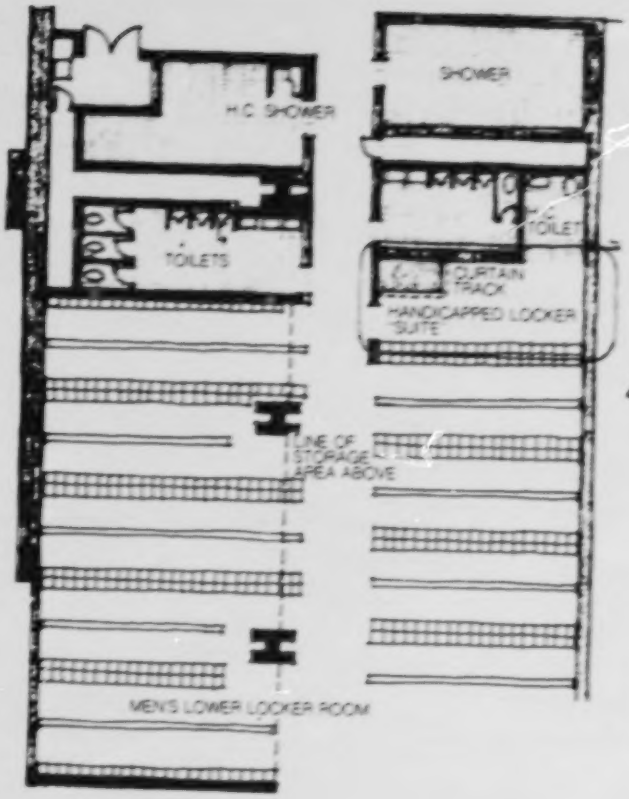
Fig. 40 The existing first floor spectator deck contains seating for persons in wheelchairs that is accessible via the existing elevator.

the building's "center of gravity" for activity purposes is located in the south addition, and the existing accessible entrance is adjacent to the parking area. The recognized "major entrance" has, in fact, already transferred from the earlier building to the new wing; the proposed solution makes effective use of this situation. Placing the accessible entrance near the elevator and the principal corridor "gets a major circulation element working" for the building, one reviewer noted. In actual practice, many campuses will find the technique of providing access to an older building through a new wing or through a connection with an accessible structure to be an economical and generally satisfactory method of achieving access.

"While the team ignored making the historical building accessible from the exterior, this is a good example of an activity building," one Technical Study Group member noted, while another commented that the Fike Recreation Center represented a sampling of "problems common to physical education plants, with varying volumes and shapes of spaces that often result in changes of level."

Access to all activity spaces was good. While some reviewers noted that ramps are preferable to some widely used lifts as a means of access to pools, they recognized that a ramp would interfere with competition lanes and thus is not feasible for this particular application.

The Technical Study Group concluded that this design represented a practical, realistic and cost-effective solution to the problems. There is no conflict with historic preservation concerns since access to the historic portion is achieved without any alteration of the original structure.



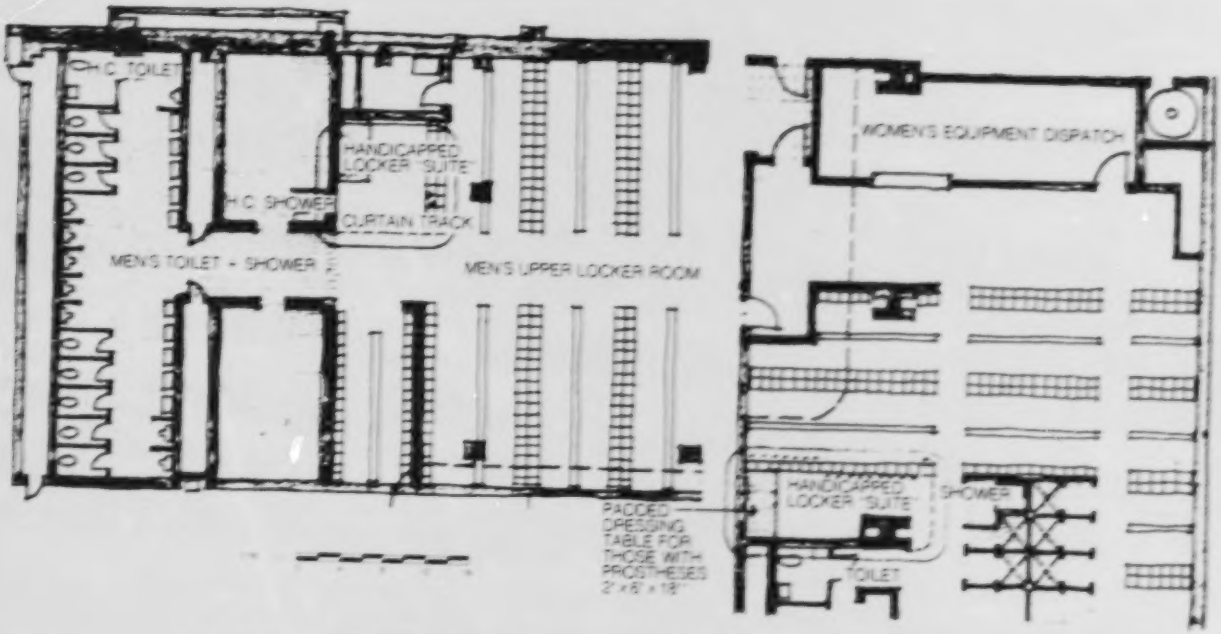


Fig. 41 These designs for locker room accommodations for handicapped individuals include padded dressing tables and curtains on tracks for those who prefer privacy. They also place the accessible toilet facilities, locker area and showers in close proximity.

Clemson University: An Historical Perspective

South Carolina citizen Thomas Green Clemson, sharing with his contemporaries the conviction that South Carolina needed a separate college devoted to industrial and scientific education, worked to realize this goal and on his death in 1888 endowed the state with the bulk of his estate for that purpose. In 1889, Clemson College was established under the Morrill Land-Grant Act.

Located in the foothills of the Blue Ridge Mountains, the Clemson campus (which gained University status in 1964) occupies the site of Mr. Clemson's plantation. The mansion of Fort Hill stands at the center of the campus and has been preserved as an historic site. The rolling terrain and park-like atmosphere of the campus is a blend of old and new, with the clock tower of Tillman Hall (1891) as the focal point of the immediate area.

44

Acknowledgements

Harlan E. McClure, *Dean*
College of Architecture

Gayland Witherspoon, *Head*
Department of Architecture
Faculty Advisor

Clemson University Design Team (left to right): Robert Silance, Gayland Witherspoon (Faculty Advisor), Chip Blair and Jerry Ballinger (Assistant). Ed Carter (not shown) also was a member of the Design Team.

DESIGN STUDY 2

Planning Accessible Office and Classroom Spaces: Iowa State University

The Building

Morrill Hall, dedicated in June, 1891, was designed by Joseylyn and Smith, architects from Cedar Rapids, Iowa. Their design was in the style often called "Richardson Romanesque" for the well-known architect Henry H. Richardson. The building (Fig. 42) exhibits the characteristic strong, heavy arches, round turrets and massive walls. It is constructed of bricks and a rusticated stone basement.

Morrill Hall was originally designed as a library and has seen a number of uses over the years. It has contained a chapel, a museum, lecture rooms, a gymnasium and various laboratories. It now houses the ISU Photo Service, located in the basement; some music department functions in the auditorium; administrative offices; and a publications department. The music department will soon be leaving the building to move into a new facility, and of its other present users, only the ISU Photo Service —the heaviest traffic center—is scheduled to remain. The building is slated for extensive remodeling in 1981 or 1982, and other potential future users are not known.

This building has been modified several times to serve many different functions, with a major remodeling occurring in 1931 under the direction of Proudfoot and Bird, architects. At that time some rest rooms were added, some lower level arches were covered and numerous interior partitions were added. In the 1950s, a university remodeling project changed the stepped auditorium floor to a level one.

Records of other remodelings are lost, but the interior of the building reveals that few, if any, of the nonstructural wood partitions remain unchanged. What does remain on the interior are structural walls, stairways, beautiful windows and the sense of being in a significant building from an earlier time. The exterior, however, is sound and basically unchanged. Student research identified only four changes to the exterior over the building's 90-year history:

- Metal fire escapes were added, to comply with code requirements.

Fig. 42. Iowa State University studied a building containing offices and classrooms, Morrill Hall, shown from the southeast perspective.

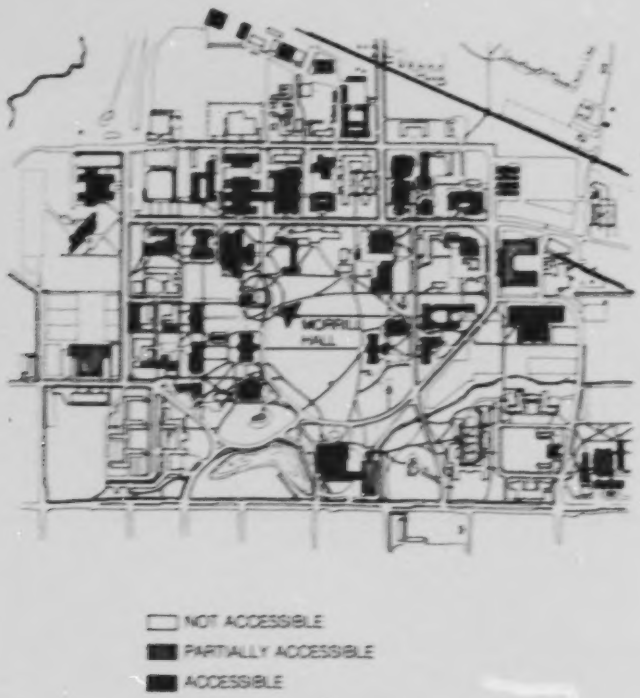


Fig. 43 Existing Site Plan: Morrill Hall

- A basement exit was carved out of the south stair tower window in 1931.
- A rear (west elevation) door and window were bricked up, at an unknown time.
- Some modifications were made to the double door on the rear (west elevation).

The exterior of the building has been well maintained in recent years. Maintenance has included cleaning and repair of the masonry, and replacement of the original roof and flashing with new materials that match the existing materials as closely as possible. Because of its strategic central location on campus (see Fig. 43) and the presence of the ISU Photo Service in the basement, Morrill Hall is expected to continue to be a building of importance on the campus.

The Problem

Morrill Hall presents a variety of accessibility problems. There is no available parking reserved for handicapped people, no accessible entrance, poor horizontal and vertical circulation, and no accessible toilet rooms or drinking fountains. In addition, the high main entrance and numerous internal level changes take place within a fairly tight shell, adding to the design challenge.

The basement level is now reached by one of two routes: the steps down to the south tower entrance or the double-door entry through the mechanical room on the west elevation, which also has steps (Fig. 33). Because of its convenience to the ISU Photo Services, the west door was heavily used at the time of this study.

At the main entrance, the exterior steps, consisting of eight risers, lead to a vestibule that is midlevel between the first floor and basement. At the south end of the vestibule, a corridor interrupted by steps leads through the tower to the second floor. Off the north end of the vestibule, stairs connect to the upper floors and the basement.

Throughout the building, minor changes in level occur on every floor, including internal level changes in some toilet rooms.

The Recommended Solution

In developing the solution, the student team focused on minimizing external changes to the basically intact building, with equal concern for creating an accessibility system that provided convenience and independence for handicapped users of Morrill Hall. The students avoided solutions that would tend to isolate or stigmatize handicapped individuals, and selected the final proposal, in part, because it promised convenience and serviceability for all building users.

These features make up the recommended accessibility solution for Morrill Hall:

1. **Site access** would be achieved by taking advantage of university construction plans in the area which affect the

Morrill Hall parking situation. The entrance to the parking lot would be changed to lead from Morrill Drive, which is lower than the existing lot. In the proposed scheme, the parking lot will be lowered 3½ feet, which would permit on-grade access to the basement level with parking spaces for handicapped people reserved adjacent to the accessible entrance. Lowering of the lot would have the beneficial effect of minimizing the negative impact of parking in a part of the campus primarily designated for use by pedestrians. Accessible pedestrian pathways on three sides of the building would connect with the accessible entrance.

2. An accessible entrance would be created on the west (rear) elevation by restoring an original door that has been bricked in (Figs. 44 and 45). This early door was at mid-basement level, with exterior steps leading to the door, but the regrading would permit lowering the new door to basement level. The restored door would match the original design in materials and style. Current use of the building has made the existing door on this side of the structure a heavily used entrance. However, this door was judged unsuitable for a formal entrance because it does not connect with the central corridor and because it opens into a mechanical area.

Modifications to the main entrance were considered but were found not to be feasible for several reasons. Ramping of the entrance steps was evaluated but rejected on the basis of the following points:

- The winter climate makes ramps difficult to negotiate, and even hazardous if not maintained properly, for several months of the year.
- A ramp would have an adverse effect on the historic facade.
- The interior stairs remained a barrier even if the entrance steps were successfully ramped.
- There is insufficient space between the building and Morrill Drive to install a properly designed ramp.

Consideration was also given to installing a wheelchair lift, but the first three constraints applying to a ramp would also make a wheelchair lift unacceptable. In addition, wheelchair lifts were felt to be a solution of last resort due to the possibility of injury or mechanical malfunction, the expense of operation and upkeep and the stigma that might be attached to a device used solely by handicapped individuals.

Since the central location on campus means that Morrill is approached from all sides, the student team determined that an accessible entrance on some other elevation of the building would be equally convenient. The existence of the parking lot and the discovery of the former doorway in a location that tied in with the central hall led to the selection of the west entrance. This doorway would recreate a strong circulation core in the center of the building and improve the pattern of traffic to the ISU Photo Service.

The proposed new entrance incorporates a vestibule lounge area at the basement level (Figs. 45 and 46) that is large enough to accommodate individuals waiting for a car. An accessible telephone is located in the waiting area as well.

3. Vertical access would be achieved by an elevator installed just off the new west entrance in the main circulation core of the building (Figs. 45, 46 and 47). This location for the elevator also permits the use of attic space for the mechanical head room, avoiding any change to the exterior roofline.

4. Horizontal circulation would be accomplished by ramping the minor changes in level that occur on the first (Fig. 47) through third floors.

5. Toilet rooms would be modified throughout the building. The basement level men's room would be changed to a women's room (Fig. 46). In the rest of the building, the existing pattern would be maintained, with the women's room located on the second floor and the men's toilets on the first (Fig. 47) and third floors. One accessible toilet

47

WEST ENTRANCE AND PARKING AREA

Fig. 44 In the design proposed for Morrill Hall, the level of the parking lot would be lowered to allow restoration of an original door (left) that would provide access to an accessible circulation core within.

SECTION A-A

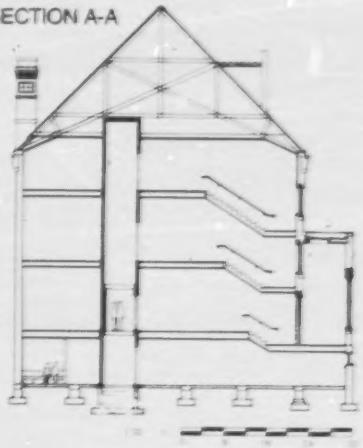


Fig. 45 This building section shows proposed changes, including the accessible vestibule and elevator.

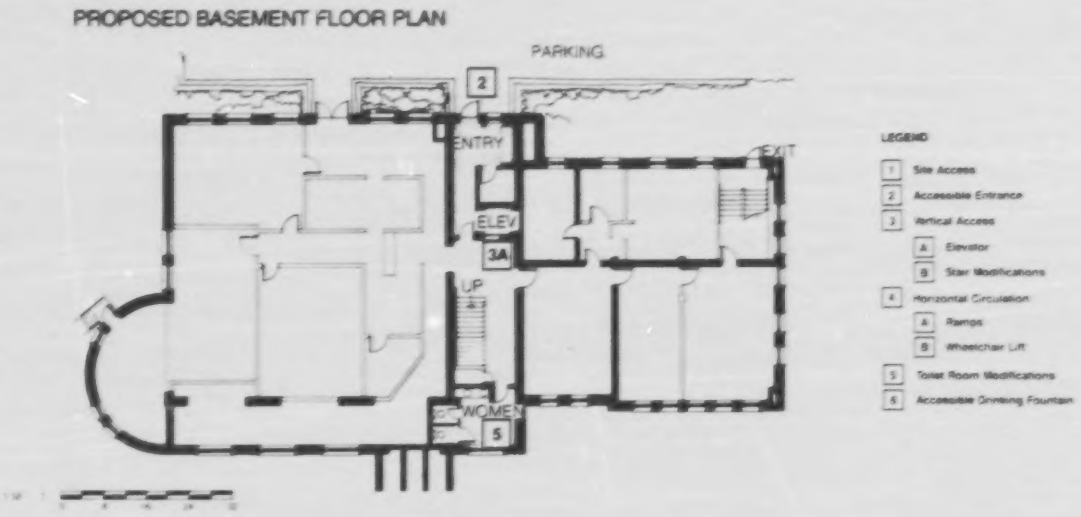


Fig. 46 The recommended solution includes creating an entry vestibule and installing an elevator at the restored entrance at the basement level. Detail drawings show the vestibule area and plans for an accessible women's rest room. All rest rooms in the building would be modified for use by handicapped people.

stall would be provided in each rest room, with fixtures and accessories lowered as necessary. This proposal encompasses major toilet room revisions, not all of which are attributable to accessibility requirements.

6. Drinking fountains that are designed for usability to handicapped people would be installed on two floors, replacing the single existing water cooler.

7. Signage would be installed to indicate reserved parking and accessible routes and areas.

8. Special spaces: The auditorium, if restored, would have open space for wheelchair users on the main level.

9. Additional program concepts

In developing the accessibility solutions for this building, the student design team also proposed additional alterations to correct deficiencies in other functions, such as fire exits, general circulation and rest room design. While these changes were not required specifically for accessibility, the scheme does reflect the actual situation that occurs when a major modification—such as installing an elevator and making substantial toilet room alterations—takes place. State codes generally require that buildings undergoing major modifications be brought into compliance with all current building codes.

This combination of accessibility and life safety modifications should work to the benefit of barrier removal as well. Most college campuses have an ongoing program of rehabilitation to upgrade older buildings for life safety; accessibility changes should be routinely included in such renovations. Some universities have found it economically wise to package access and life safety alterations for a group of buildings, to be bid and carried out by a single contractor.

Technical Study Group Comments

The real character of this building is the exterior, and the proposed solution respects this historic fabric with the additional advantage of restoring an original doorway. While there was some concern about the accessible entrance being on the rear elevation, it is recognized that several factors argue against modifying the east entrance. Lack of space for an exterior ramp on the street frontage and the complicated interior stair configuration at the front of the building make the west entrance a logical choice. The overall treatment of the new entry, the location of the building on campus and the provision of the vestibule lounge area make this a second principal entrance.

The proposed solution provides access to the heart of the building and creates a convenient circulation core that will benefit all users of the facility. Basic accessibility criteria are met, with some exceptions that will require further refinement. The principal question raised was related to providing the necessary clear space on the latch side of doors, in particular the west entrance door (which is recessed) and the rest room doors.

One reviewer noted that the landscaping at the new entrance would be more compatible with the building if the raised beds had simple retaining walls or berms rather than the treatment as drawn. It was also suggested that the steps should be removed in the pedestrian path that approaches the parking lot from the south side, thus making the new entrance accessible from all sides of the building. Rather than developing this area as a parking lot, another reviewer observed, it could become an attractive pedestrian plaza.

Another member of the Technical Study Group commented that a second accessible entrance to the building

PROPOSED FIRST FLOOR PLAN

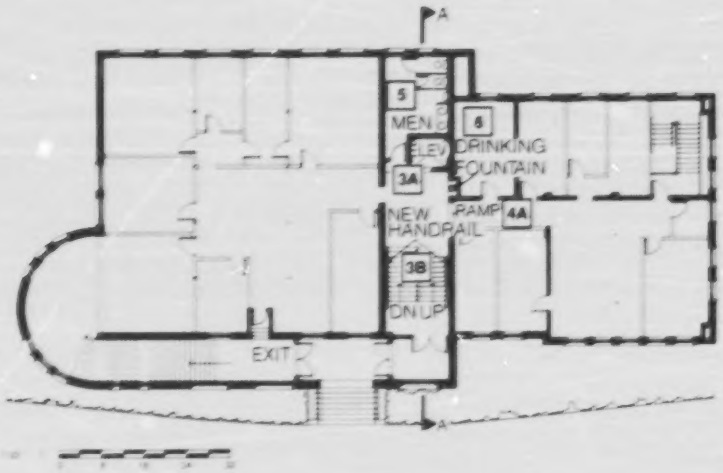


Fig. 47 Recommended rest room modifications and the proposed new elevator appear on the first floor plan designed for this project.

could be easily developed by installing a below-grade ramp curved to follow the exterior lines of the south tower, where the existing steps lead to the south basement door. If compatible with fire code requirements, this entrance would provide a useful alternate means of access for handicapped individuals approaching the building on the accessible sidewalk, with its existing curb cuts, from the south or east.

Consensus of the Technical Study Group was that this design project is compatible with both the historic fabric of the building and its present uses, and represents a solution that offers functional improvement for all users of Morrill Hall. "Linking the elevator and toilet rooms in a central location," one member of the group noted, "is clean, simple and logical." The concept of using site work to achieve access rather than relying on mechanical means such as a wheelchair lift is particularly good. While the recommended alterations would be expensive, there is no other apparent alternative that would provide full access.

Iowa State University: An Historical Perspective

Created as "Iowa Agricultural College" by the Iowa General Assembly in 1858, Iowa State became a land-grant college under terms of the Morrill Act in 1863. It was a worldwide pioneer in the establishment of agricultural studies on a college level, was the first state institution to found a veterinary school, helped move the engineering profession to its present key position in an industrial society, emphasized basic sciences, and took leadership in establishing the profession of home economics. It was renamed Iowa State College of Agriculture and Mechanic Arts in 1898, and became Iowa State University in 1959. Its program is now broad-based with special responsibility in science and technology.

Acknowledgements

Stanford A. Greenfield, *Chairman*
Department of Architecture

Arvid Osterberg, *Faculty Coordinator*

Student Team

Carmen Behm
Ken Field
Bill Kleiman
Garry Rasmussen
Randy Martin, *Photographer*

DESIGN STUDY 3

Accessibility Recommendations for a Classroom Facility: Kansas State University

50

Fig. 48 The Kansas State University design team studied Dickens Hall, a building housing classroom and laboratory spaces.

Dickens Hall (Fig. 48) was designed in the Romanesque style and was built in 1907 to plans developed by State Architect John S. Stauton. The facade of this rusticated stone building is strongly symmetrical, and the distinctive arch at the entry is repeated over windows on the first and third floors.

The interior stairwell (Fig. 49), with fine detailing in wood, provides the building's architecturally rich space. The Ionic capitals of carved oak reflect classical mannerisms in campus architecture that were common at the beginning of the century.

Originally, the building was known as Horticulture Hall. It has housed Horticulture, Plant Pathology and Botany from the time of construction. Although dedicated at its construction to the memory of the late Albert Dickens, who was head of the Horticulture department for 28 years, the structure did not bear his name until 1931.

Dickens Hall is now scheduled to be renovated for use by the Computer Science and Statistics departments, with shared laboratory and classroom spaces.

The Problem

Problems with site access include the lack of reserved parking spaces, curb cuts and adequate lighting. The building itself has no accessible entrance. The basement entrance (north elevation) has two risers up and five down; the main entrance on the south elevation has three steps up to the landing, fourteen risers up to the first floor and seven risers down to the basement level, all presenting architectural barriers immediately inside the door.

Interior stairs exhibit several problems, including projecting nosings and a number of handrail deficiencies — handrails placed too low, rails that do not continue at turns in the stairs, and handrails not extending beyond the end of steps.

All toilet rooms are inaccessible, as is the single drinking fountain. Controls, including light switches and thermostats, are generally higher than recommended. No tactile signage is provided in the building.

In developing their accessibility solutions, the student team emphasized the coordination of its designs with the character and original design intentions of Dickens Hall. At the same time the students worked to provide access that would allow handicapped individuals to use the building on the same terms as other users.

Fig. 49 The grand stair in Dickens Hall is both an outstanding feature and a major barrier. The accessibility scheme would preserve the stair with its fine detailing.

The design proposed in this project allows the handicapped user to approach and enter the building through the same historic entrance that others use, the landing under the great stone arch. An elevator would provide vertical access to all levels of the structure.

Details of the plans for accessibility include:

1. Site access would be developed by adapting the university plan for landscaping between Dickens Hall and a new classroom building (Fig. 50). Planned walkways linking the two buildings are supplemented in this scheme by symmetrical curved walks that are congruent with the symmetrical massing of the building. As the curved walks approach the building, they would assume a gentle slope that would gradually raise them to the level of the entrance landing. The landing itself would be extended approximately six feet in front of the arch, and the three steps would be moved out from the arch to the new edge of the landing. This method would provide sufficient room for the sloped walks to feed onto the landing while retaining the change of level that is part of the progression from the outside to the interior space. Handicapped users are thus able to bypass the change in level while still enjoying the opportunity to experience the formal entry.

Reserved parking spaces would also be set aside in the parking lot on the east of the building and curb cuts would be provided as needed to link with the sloped walkway.

2. An accessible entrance (see Fig. 51) can now be provided at the building's formal entry with only minimal threshold work. However, additional work is proposed at this point. Of the set of three doors at this entrance, the right-hand door has been permanently closed for many years. In order to provide more convenient access to the elevator and a safer emergency exit route for handicapped people that would be out of the line of the main traffic flow, this door would be reopened.

3. Vertical access would be provided by a hydraulic elevator (Fig. 51). This is seen as a potential safety factor in the event of a fire, since a hydraulic elevator with the mechanical room located between masonry bearing walls can remain operable for some time under fire conditions and would probably allow the evacuation of handicapped people from upper floors. In addition to providing access for handicapped people, this elevator would allow movement of computer equipment to upper levels of the building. Existing wood molding around the doors would be retained if possible when enlarging the openings for the elevator.

Stairs would be modified with wooden inserts to eliminate projecting nosings and inadequate handrails would be supplemented with bentwood rails in a matching finish.

51

SITE PLAN

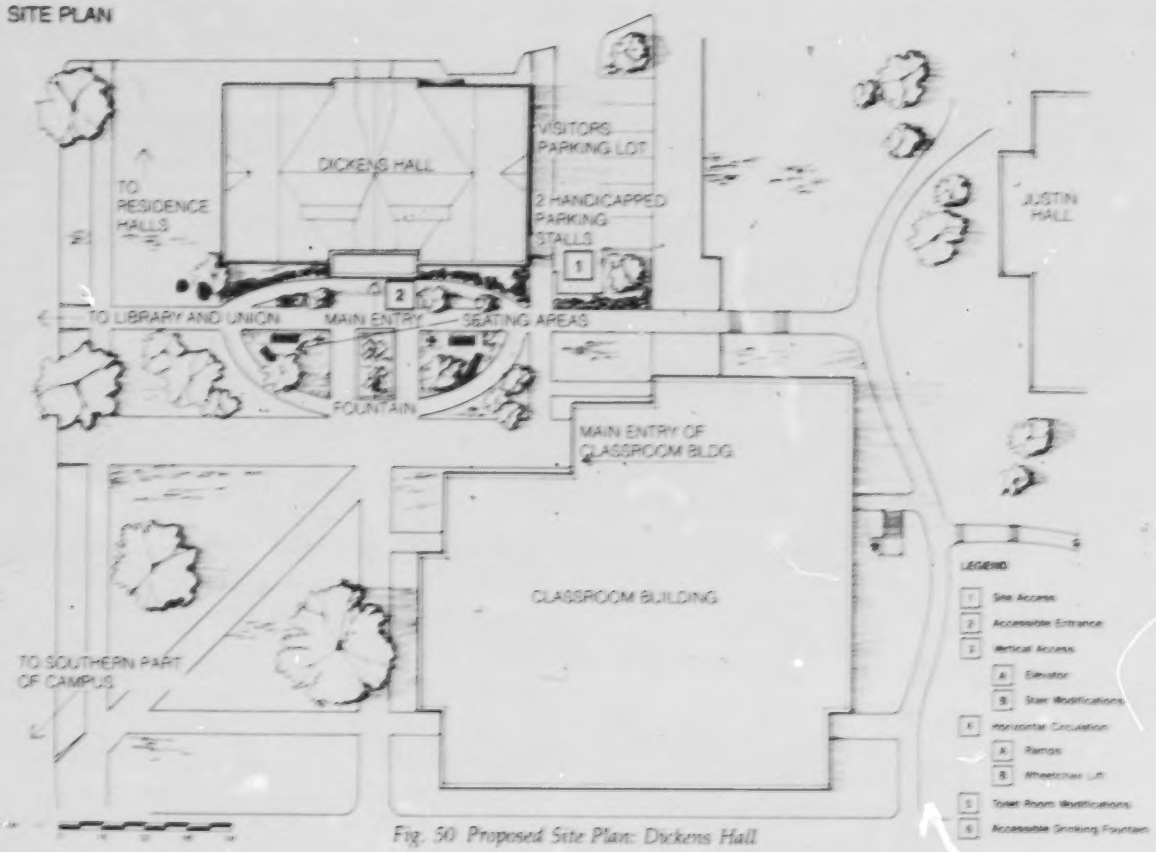
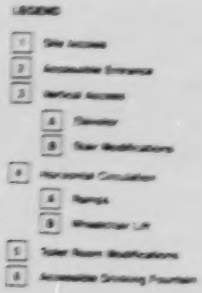
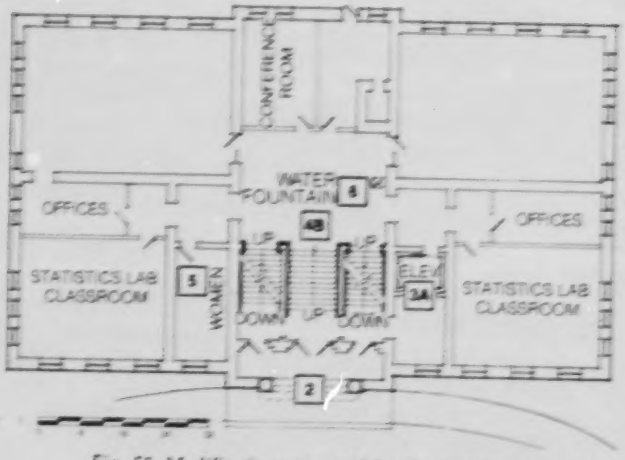


Fig. 50 Proposed Site Plan: Dickens Hall



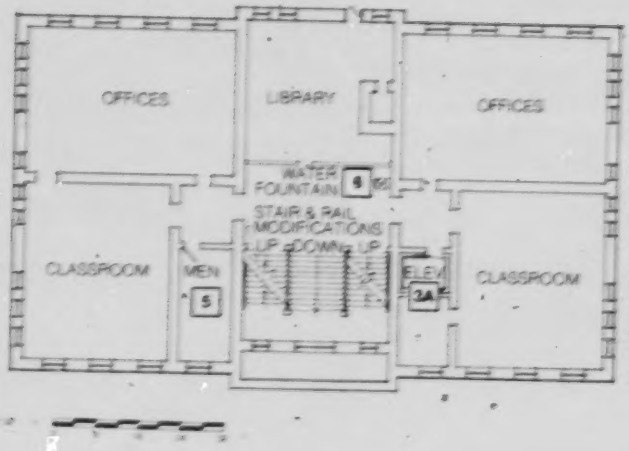
PROPOSED FIRST FLOOR PLAN



52

Fig. 51 Modifications proposed for the first floor include alterations at the entrance to move steps away from the building, creating a landing to serve the inclined walks curving up to the entry; a reopened door on the right for more convenient access; a new double-opening elevator; a women's rest room modified for accessibility; and a water fountain relocated to eliminate a hazard to visually impaired people and modified for use by mobility impaired people.

PROPOSED SECOND FLOOR PLAN



The proposed second floor plan shows the elevator opening on its second side for access to the main corridor, a men's rest room and a water fountain modified for accessibility. Other proposed changes include stair and handrail modifications and threshold alterations where needed.

4. Horizontal access would be achieved within the building by several means. Doors in a number of locations would be fitted with "swing-clear" (offset) hinges to provide the necessary clearance, and thresholds throughout the building would be repaired and beveled or ramped as necessary. On the first floor, a new door would be cut through to the elevator lobby. Throughout the building, doorknobs would be replaced with lever handles.

5. Toilet rooms would be altered as required (see Fig. 51). One accessible stall would be provided in each, and fixtures and accessories would be remounted at appropriate heights.

6. Drinking fountains would be provided on two floors. The existing fountain on the first floor would be fitted with a cup dispenser to make it usable, and a new fountain designed for accessibility and usability would be installed on the second floor.

7. Signage would be provided as needed to meet the needs of visually handicapped people and wheelchair users. Tactile signs, including raised floor numbers on elevator door jambs, would be provided throughout the building. All room numbers and access signs would be in three-dimensional relief. Tactile warning systems such as knurled doorknobs and textural changes in floor surfaces would be used as needed.

8. Special spaces: Existing pathology laboratories are not accessible, due to high counters and cabinets that cannot be reached from a wheelchair. However, these laboratories will be removed from the building when renovated and therefore are not part of this accessibility solution.

9. Additional program concepts: As in some other design projects, a number of features related to life safety were considered and recommended for inclusion if this proposed modification program is carried out.

Technical Study Group Comments

This building has two important elements — the arched entrance and the interior stairwell. This design preserves both significant elements and makes them a part of the experience of all users of the building. The proposed solution does not disturb the integrity of the architecture; indeed, the curved ramps complement the forms of the entrance. The approach also works well in terms of access, providing a centrally located elevator that conveniently serves all levels of the building. Since the most expensive element of the modification, the elevator, would be required in any case for the building's new use, this is also a very cost-effective solution.

"An excellent design," noted one reviewer, who added, "The choice of paving material for the curved walks and ramps will be important in fulfilling the basic premise of the design."

The reviewers pointed out that the treatment of the elevator penthouse dormers may be over-designed. While the two dormers do maintain the symmetry of the building, it is unnecessary to attempt to make them appear to be original to the building. The windows will serve no function, and stone as a material for roof dormers may not be structurally possible. It is suggested that a simple shed or hipped roof dormer directly over the elevator shaft would serve the necessary purpose in an unobtrusive manner.

One reviewer questioned whether building codes will allow the proposed use of the elevator in evacuating handicapped persons from upper floors.

Also, reviewers noted that the cost of the total project should allow for replacement of the existing water fountain with an accessible one, instead of fitting the existing water fountain with a cup dispenser.

Overall the design project was judged to be a good, rational solution to the problems of accessibility and preservation of historic character. The project exemplified, one reviewer stated, "the use of ordinary tools in a sensitive way that is compatible with the building."

Acknowledgements

Bernd Foerster, *Dean*
College of Architecture

Eugene Kremer, *Head*
Department of Architecture

W. Mike Martin, *Associate Professor*
Faculty Coordinator

53

Kansas State University Design Team (left to right): Randall Schroeder, Brian Connell, Rosa Acevedo-Ramos, Kim Chinn and Thomas Snodgrass

Kansas State University: An Historical Perspective

The city of Manhattan, Kansas was barely three years old when an association formed to establish Bluemont Central College. The college opened in 1860 with a single building on a site of 100 acres, serving 53 students under the charge of a principal teacher and one assistant.

When the Morrill Act of 1862 established the land-grant college system, Bluemont offered its campus. The state legislature designated Bluemont as Kansas State Agricultural College on February 16, 1863. The Kansas legislature was the first to designate a specific college as its land-grant institution; as a result, Kansas State became the first land-grant college in the United States.

In 1875, the campus moved from the original site to a location adjacent to Manhattan. This new site of 160 acres is the home of the present campus. A general campus plan adopted in 1885 included drives, plantings, outdoor laboratories for horticulture and landscape architecture, and the development of a shelter belt of trees around the campus.

The turn of the century brought a serious reinterpretation of the role of a land-grant institution. To reflect the broadened character of the school, the college was renamed the Kansas State College of Agriculture and Applied Science in 1931, and became Kansas State University in 1959.

DESIGN STUDY 4

Adapting A Building for New Uses: University of California/Berkeley

54

The Building

In 1906, a small, shingled building was erected to house the office of the University of California/Berkeley's Supervising Architect, John Galen Howard, and the Department of Architecture that he headed. Howard himself was the designer of the building, executed in the style known as "First San Francisco Bay Region," and though he considered it a temporary building it has continued in use up to the present time. Howard was also responsible, through the firm of Howard and Galloway, for three subsequent additions to the building.

The original structure, known to students as the "Ark" but formally called North Gate Hall, was a small, two-story building with its entrance at the north gate to the campus, off Hearst Street. In 1908, the first addition was constructed, adding three drafting rooms and a studio overlooking Hearst Street on the north. A small project in approximately 1910 tucked a library into the angle where the two sections of the building met. The next expansion added a glazed corridor along the south side of the building and an auditorium, studio and exhibition hall on the east. In 1936, Architect Walter Steilberg designed the final major addition, consisting of the fireproof library and the west corridor (extended to connect the new south wing

Fig. 52 North Gate Hall's brick-paved courtyard has two levels, with entrance doors on each.

Fig. 53 The University of California/Berkeley studied a building currently containing classrooms and offices, North Gate Hall. This building is being converted to a journalism building. Rooflines graphically portray North Gate Hall's numerous expansions over the years, resulting in at least twelve different levels within the two-story building.

Fig. 54 Proposed Site Plan: North Gate Hall

with the original building). This last addition created the courtyard (Fig. 52), which was further developed over the years by students and faculty. In 1952, one further addition added a dean's suite and faculty offices off the western leg of the glazed corridor and at the end of the south wing. North Gate Hall is shown in Fig. 53 as it appears today.

The most striking features of North Gate are its three large studio windows that break the generally low profile of the building and flood their rooms (originally architectural drafting rooms) with north light; the high ceilings in the drafting rooms; interior shingles and sheathing in the glazed corridor, as well as the casement windows that punctuate the corridor's interior walls; the exposed wood trusses in the lecture hall; and the skylight in the stairway to the exhibition hall. The interior windows, shingled walls and glazing of the single-loaded corridor work together to integrate the interior and exterior of the building.

North Gate Hall is one of five buildings erected on the campus between 1905 and 1916 that were constructed in similar informal style and used similar materials. These buildings represent a distinct era in the development both of the campus and of a regional architectural style. During the first twenty years of campus development, buildings were of the early French Renaissance style. Earlier wooden buildings at Berkeley were executed in Queen Anne or classic revival styles of light frame construction. In contrast to the earlier buildings, North Gate Hall and its companion period buildings typify expressions of the academic interest of the time in natural materials and a return to simpler values.

The structure is also important for its associations with architects who studied there and created a regional style in which the atmosphere and attitude of informality are significant elements. This informality may have been derived from the character of the building in which they were trained, with its low profile, straightforward expression of structure and materials, integration of indoor and outdoor spaces, and atmosphere of warmth and naturalness.

North Gate Hall is also significant as part of a historic remnant of a pre-World War I era residential community. From President's House, below North Gate, to the Naval Architecture Building next door and across Hearst Street to the Ernest Coxhead house is preserved a small slice of the cityscape that reflects the unpressured development of its time.

Today the building is cherished for its humane qualities. Now, in a transition period between use as administrative offices and renovation to house the School of Journalism, its future tenants have expressed their pleasure in planning a move to a building that offers "a sense of space and community."

Structurally, most of the building is single-wall, wood-frame construction. The south wing library is built of reinforced concrete and concrete block. With the exception of the library wing, which was an example of the most modern fireproofing systems of its time, all of the many additions to North Gate have been executed in style, materials and scale that are compatible with the original "Ark." This consistency of style throughout the many-leveled building gives to the structure an air of having grown organically upon its sloping site.

The Problem

North Gate's accessibility problems stem primarily from one of the most distinctive elements of its design, the north wing that steps in gradual increments up the Hearst Street hill (see Fig. 53). The glazed, single-loaded corridor serving this wing and the east wing has five separate sets of steps along its run. In addition, the building has three separate two-story sections, one of which shares no level connectors with other parts of the building. Altogether, there are at least twelve different levels within the building, with only one of them currently accessible to individuals using wheelchairs. Similarly, of eight separate entrances, only a single door can be entered in a wheelchair.

The building has other accessibility problems as well. There are no accessible toilet rooms, drinking fountains or public telephones; no handrails on the corridor stairways, which also present a hazard to visually impaired people by virtue of their design featuring a broad, stepped cheekwall; projecting water fountain and fire extinguisher in the glazed corridor; and no signage. Vertical access is provided only by stairs.

The Solution

Because the multiplicity of levels throughout the building and the lack of level connectors between the east wing and the other two-story sections make it impossible to establish a principal circulation route, the design solution for North Gate Hall is based on providing a number of accessible entrances, supplemented by internal ramps and an elevator. Service elements are clustered near the elevator, which is the centerpiece of an accessibility system linking 8,600 square feet of functional space.

The accessibility program plan is based on four criteria established by the students:

- access to all areas providing services or programs that could not be duplicated in other spaces.
- recognition of symbolic qualities of functional relationships.
- accommodation of service needs.
- respect for key elements of significance in this building's design.

Elements of the proposed solution are:

1. **Site access** (Fig. 54) would be provided by reserving

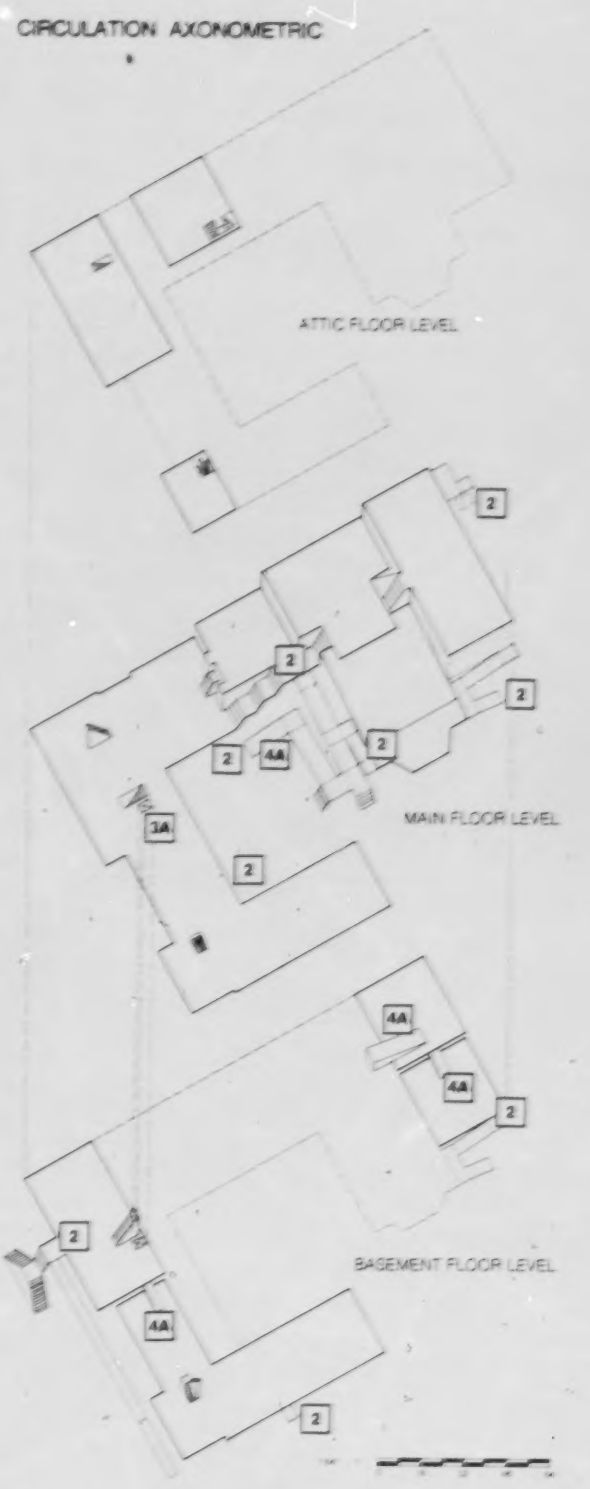


Fig. 55 This axonometric drawing illustrates the circulation patterns on all levels. Proposed accessibility modifications include nine accessible entrances, interior ramps and a new elevator.

parking spaces at three locations around the building and by developing new walks to connect these parking spaces with accessible entrances. One new path would be created in the approximate location of an original sidewalk leading to the historic main entrance of the building, a walk revealed in early photographs before the small original structure was launched on its history of expansions.

2. Nine accessible entrances (Figs. 54 and 55) would be available, only one of which would represent a new door cut into the fabric of the building. Together, these entrances provide access to all levels of the building with the exception of three individually isolated attic rooms. The accessible entrances include, on the lower levels:

- *main entrance* on the west elevation, made accessible by the development of the new path as noted above.
- *south wing basement*, where a new door would be cut through a window.
- *south elevation of the east wing*, where a new ramp would provide access to the two rooms on the lower level of this wing.

In combination with some internal ramps to overcome changes of level on the interior, these entrances would provide access to all of the basement level with an accessible path established linking the west and south wings. The east wing shares no level connection with the other spaces at this or its higher level.

On the main level, accessible entrances would be:

- *north side at courtyard level*, the only existing accessible entrance, which enters the glazed corridor that connects all spaces west and south of this entry at this level.
- *west side at courtyard level*, which needs only threshold modifications to provide a second accessible entrance to the glazed corridor at this level. These two doors, connected by the glazed corridor, would make all of the main level of the west and south wings accessible and also make it possible to reach the first section of the north wing.
- *mid-section of the north wing*, where a courtyard ramping system (Fig. 56) would bypass three sets of steps in the glazed corridor and make it possible to reach this level of the north wing, thus providing access to one classroom space; the proposed ramping system includes seating space and is designed to enhance the courtyard, retaining much of the existing planting beds and vegetation.
- *west entrance to lecture hall auditorium*, where the proposed courtyard ramping system (Fig. 56) would provide access to the lower level of this space.
- *east entrance to lecture hall auditorium*, reached by a connection with a proposed ramp (Fig. 57) leading to the basement level of the east wing.

57

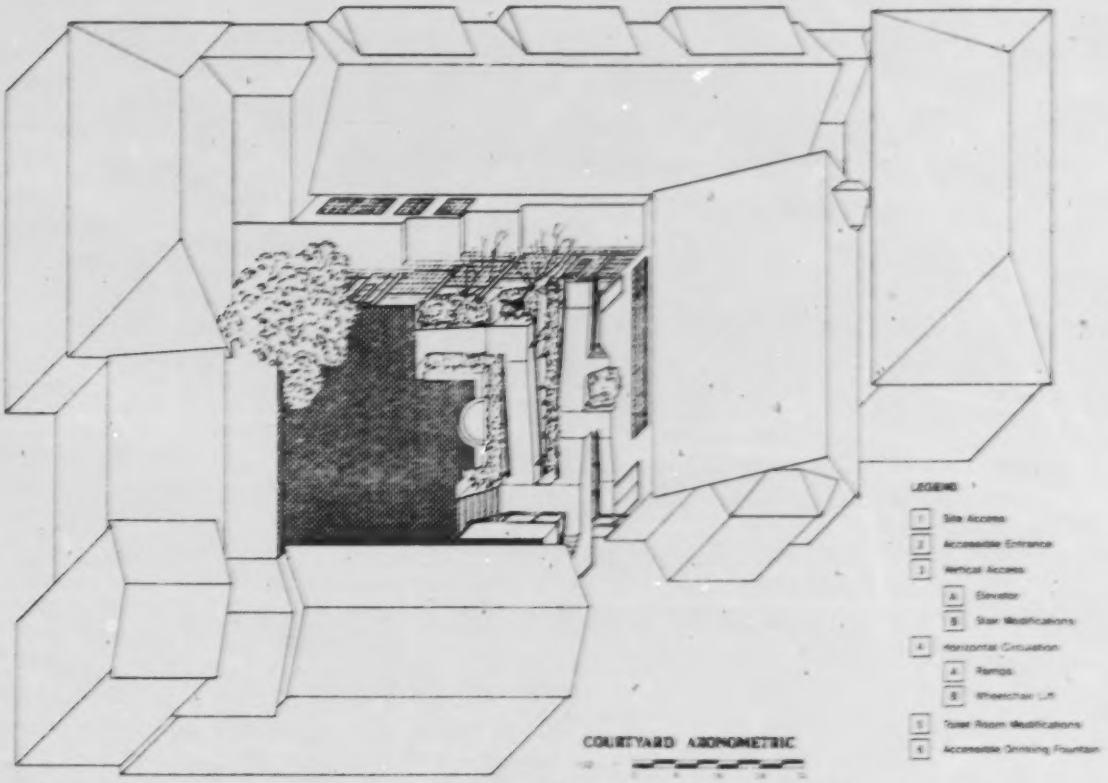


Fig. 56 Proposed courtyard alterations appear on this axonometric drawing. A ramping system would provide access to two areas: one level of the glazed corridor and the lower level of the theatre-auditorium.

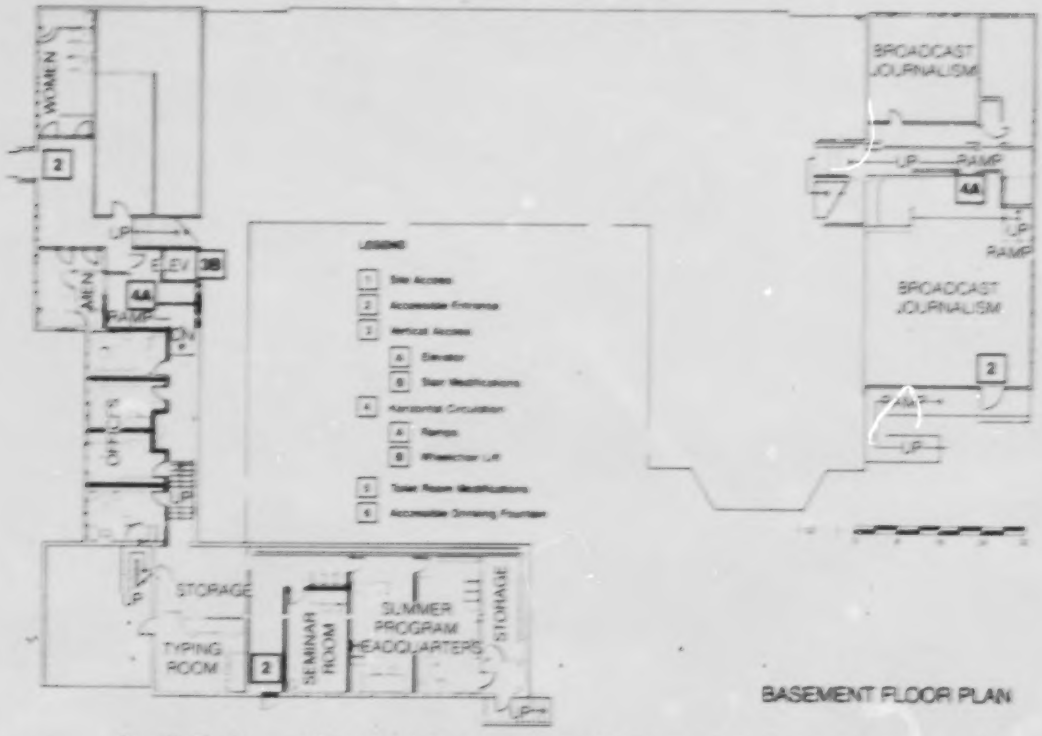


Fig. 57. The basement floor plan indicates proposed modifications that would provide three accessible entrances. It also shows the proposed elevator and proposed internal ramps in the east and west wings.

• *east entrance to the building*, where a wheelchair lift (Fig. 55) would provide access to the upper two rooms of the east wing.

3. Vertical access between floors would be provided in this scheme by an elevator and internal ramps (Figs. 55 and 57). A new elevator would be installed in the section of the building that was the original structure. This elevator would serve all of the original building, the link connecting the original structure to the south wing and the south wing itself, and the first (lowest) section of the north wing.

However, because of the presence of four sets of steps in the glazed corridor that serves the north and east wings as the circulation artery, this elevator could not serve the three rooms making up the remainder of the north wing, the lecture hall/auditorium or the east wing. An internal ramp system would provide vertical access between the basement level of the east wing and the upper landing at the end of the corridor, thus providing access to the upper level of the lecture hall and two additional rooms that are used for seminars.

The existing stairways would be brought up to accessibility standards by the addition of handrails (Fig. 58), designed to harmonize with the warm wood interior and open feeling of the glazed corridor where the stairs are located.

4. Horizontal circulation would be achieved wherever possible by internal ramping. Where ramps are not feasible on the interior, the courtyard (Fig. 56) comes into play as an element in the horizontal circulation pattern by means of an exterior ramping system that overcomes changes in level as the north wing climbs up its sloping site.

5. Toilet rooms for each sex would be modified as required for accessibility. The only existing toilet rooms are located on the basement level in the original building. Proposed toilet room modifications are shown in Fig. 59.

6. A drinking fountain designed for accessibility would be installed in the elevator lobby on the basement level, convenient to the toilet rooms as well as lying on the circulation path that connects the major portion of the building.

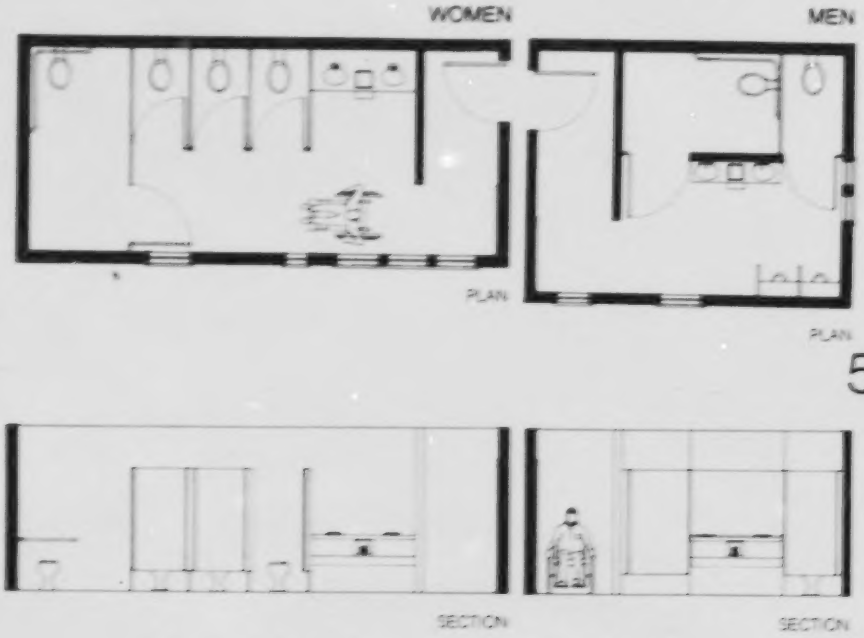
7. Signage would be provided as necessary, including access signs on entries and toilet rooms and Braille room numbers and nameplates.

8. Special spaces or design considerations

• *An accessible public telephone* would be installed in the basement level elevator lobby, which is established as a central accessible service core located conveniently near the toilet rooms and the historic main entrance to the building.

• *Objects projecting* into the corridor space and creating a hazard for visually impaired persons would be relocated, recessed or reconfigured to be detectable by a long cane.

Fig. 58 Proposed handrails would eliminate the hazard for visually impaired people presented by the broad stepped cheekwall at the top of the stairs.



59

ACCESSIBILITY MODIFICATIONS: TOILET ROOMS

Fig. 59 Proposed toilet room modifications would provide access for handicapped individuals.

These objects include the drinking fountain and fire extinguisher.

9. Additional program concepts

In the proposed future use of this building, North Gate Hall will house the school of journalism in the south and west wings and lower portions of the north wing; the lecture hall and two seminar rooms at the upper landing of the corridor will be assigned to general university use; and the east wing may eventually become the home of a broadcast journalism division. The accessibility system as designed would provide continuous access to all spaces except one of those included in the journalism program. Further, this continuous accessible space may be reached from any one of the entrances serving that portion of the building. The sole exception is Room 11, the upper of three rooms designated together as the newsroom. Although this room is individually accessible via the courtyard ramp, its accessibility is not programmatically required since functions in the upper level can easily be conducted in the lower rooms.

The courtyard ramp serves a second and broader purpose as well as providing access to some interior spaces, however. Graduation ceremonies at Berkeley are conducted on a departmental basis, and the prospective tenants of North Gate Hall are pleased with the possibility of using the ramp system as the ceremonial stage for courtyard graduation exercises. Further, given the traditional use of the courtyard as informal gathering space, the ramp system with its built-in seating and plantings will add another dimension to this outdoor social area and will serve able-bodied as well as handicapped students and faculty. The temperate climate at the Berkeley campus makes intensive use of such an outdoor space possible.

There is another point of consideration in development of this plan. North Gate Hall is located at a significant campus intersection, and the student team recommended that the renovation of the structure be accompanied by the addition of a formal gate of entry to the campus at the North Gate site, in order to restore the building to its context. At the same time, the plan envisions a strengthening of the building's orientation toward the campus by emphasizing courtyard development.

Technical Study Group Comments

This scheme on the whole is compatible with the character of the building as it has existed and developed over the past seventy-four years. While a more integrated system of access, in which a major accessible route of travel would link up all essential elements of a building, is preferred, the severity of the access problems in this building due to the multiple changes of level probably make the more fragmented approach unavoidable. And, according to its programmed future use, the isolated elements of the building basically will be functioning independently, a further rationalization of this approach. At any rate, the building historically has offered numerous entrances to its users and the courtyard traditionally has functioned almost as an integral part of the building. This

design follows in the same pattern. One reviewer questioned the use of an open ramp as an accessible corridor, in effect, and suggested that a simple covering (a canvas awning, for example) could be developed that would be compatible with the overall design. Others noted that the climate in Berkeley might not require a covered ramp.

Two details of the plan that related to historic preservation were questioned by Technical Study Group members. There was a strong feeling expressed that the reconfiguration of the steps on the west elevation as proposed represents a change from the original design that unnecessarily alters the face of the building. According to early photographs, the site originally accommodated an inclined walkway in the approximate location of the one being built in this scheme and the existing, or a similar, direct flight of steps to the street. It should be possible to duplicate this arrangement.

It was also noted that the alteration of an original window to create a new door on the south elevation could be avoided by using a below-grade ramp to the entrance already existing on that level. Although it is recognized that the existing entrance is not as conveniently located with relation to the principal circulation corridor as the proposed entrance, its use would prevent piercing of the historic fabric and is better located with respect to emergency egress.

Enlarging a window to create a new door can be an acceptable practice in making historic buildings accessible, but its use should be limited to those cases where no other alternative exists. It is questionable if the door into the south wing basement qualifies.

Another point of concern is the stair handrail design. Stanchions as shown on the detail drawings do not work well and are out of character; a smaller, more sensitively designed support system mounted on the side of the step cheek would be aesthetically preferable and would provide a stronger mounting system. The hand railing itself should be wood to harmonize with the other finish materials, rather than metal as indicated.

One additional item that should be noted is the proposal for Braille signage. Specification of Braille for tactile signs only benefits a small number of blind people, while engraved or raised alphabet letters and numerals benefit the majority of blind and partially sighted people who do not read Braille.

Most aspects of this scheme are well within acceptable cost ranges, but the courtyard ramp system was questioned on the basis of cost-effectiveness. While its additional function as a social forum is recognized, in terms of accessibility it provides access to only one room (Room 11). This room could be linked to the lower level (Rooms 11a and 11b) by a wheelchair lift, a solution that would be less costly than the ramp. Although the ramp does provide access to the lecture hall as well, alternate access to that space is provided by the ramp on its east side as well as on its upper level, via the internal ramp system leading up from the basement level of the east wing.

Overall, this approach was an imaginative response to a very complex situation. The design is a sympathetic treatment that respects the unique characteristics of this building.

University of California/Berkeley Design Team (left to right): Gregg Herman, Tim Doudna, Andrew Chiu, Kevin Johnson, Gary Knecht and Ray [illegible]z (Faculty Advisor).

University of California/Berkeley: An Historical Perspective

The University of California/Berkeley is one of nine campuses that form the University of California. Of the nine campuses, Berkeley is the oldest.

The University began in 1868, and the Berkeley campus opened in 1873. Faculty members and 187 students witnessed the opening of the campus, standing at the corner of Cagley Road and Hearst Avenue and looking out through the unbridged Golden Gate. Founder's Rock marks the site today, commemorating the naming of the gently sloping area below after the British philosopher, George Berkeley.

The campus now covers 178 acres of land and has 29,000 students.

Acknowledgements

Joseph Esherick, *Chairman*
Department of Architecture

Raymond Lifchez
Faculty Coordinator

Kenneth Cardwell
Historic Preservation Consultant

Accessibility Advisors:
Cheryl Davis
Mary Anne Hiserman
Stephen Hofmann
Deborah Norling
Peter Trier

DESIGN STUDY 5

Solving Accessibility Problems in Old Main: University of Colorado

The Building

Originally called the University Building, Old Main (Fig. 60) was the first structure on the University of Colorado campus. When completed in 1876, the year Colorado gained statehood, Old Main housed University President Joseph A. Sewall and his family of five, a library, art gallery, lecture hall, laboratory, chapel and dormitory space for many of the 44 original students.

Designed by Architect M.E. Dimick of Boulder, Old Main was built with matching grants of $15,000 each from the Colorado legislature and residents of Boulder on a donated site of more than 52 acres. The structure was described by a Denver newspaper at the time as "a naked, ill-constructed building, situated in a barren waste, and removed from any sidewalk by nearly a mile of mud." Despite the early criticism, Old Main has been in continuous service as office or classroom space throughout its history and housed the entire University until 1884, when four new buildings were added to the campus. In 1924 an attempt was made to raze the "naked, ill-constructed building," but alumni effort saved Old Main and structural improvements were made. Its primary current use is to house the Modern Foreign Languages Department, providing faculty offices, classrooms and language laboratories. Classes from other departments are also scheduled in Old Main as space permits.

61

Fig. 60 The University of Colorado studied a building containing classrooms, offices and language laboratories, Old Main. The most formal of Old Main's entrances, shown above, is on the north facade.

The building is designed in a simple Victorian style. Its red brick exterior fits in well with the nearby structures and with the style of campus buildings in general, which are faced with rough pink and red sandstone. Among the striking exterior features of Old Main is the upright form of the building itself, created by tall, narrow windows and the towers located in the middle of the north and south sides of the building. Other striking characteristics are the simple but rich brickwork and woodwork at the eave line and the brick buttresses that project from the line of each wall at the corners of the building. Interior details contributing to the historic ambience include a wide decorative molding applied around door openings, the majestic wooden staircases with ornate railings and balusters, the polished oak flooring and the high ceilings.

Old Main is built of bearing wall construction, with exterior walls of 24-inch-thick stone at the basement level and of brick above. Thickness of the exterior brick walls decreases from 18 inches on the first floor to 16 inches on the second and 12 inches on the third. Structural renovations have occurred over the years, as revealed by the complex augmented system of heavy timber trusses and metal tie rods housed in the attic space. The wooden beams bear on the exterior walls, and the tie rods maintain the structural integrity of both masonry walls and wooden framing.

The Problem

Old Main presents a number of barriers to persons with physical handicaps such as loss or impairment of limbs, loss of sight or hearing, and impaired coordination. These barriers begin with access to the building itself. Although there is an access road adjacent to Old Main (Fig. 61), no parking spaces are reserved for handicapped people. A person must enter the building at the first-floor level by means of one of the long, steep stairways at each of the three entrances. The basement level is reached down a short flight of steps at any of the three exterior entrances to this level. An additional obstacle to entering the building is present at the north elevation, in the form of a wooden platform step from the exterior stair landing to the door threshold (Fig. 62). The nosing of the step could

catch the foot of an individual with a leg brace. Also, the railings on the outside stairway at the north entrance are too large to be easily gripped by persons with motor disabilities.

Inside the building, a variety of obstacles may prevent movement between spaces on any one floor. The principal problems in horizontal circulation are caused by narrow doors; however, in the chapel, now used as a lecture hall, two other problems occur. On the main level of the chapel, the floor slopes upward for several feet before beginning a downward slope to the stage. In addition, the aisles are narrow. A step up onto the balcony level prevents access there.

Existing toilet rooms have inadequate turning space for wheelchair users, stalls and aisles too narrow for accessibility, and no grab bars in the toilet stalls.

Vertical access between floors is now provided solely by means of stairs (Fig. 63), which themselves do not meet accessibility standards. Risers have projecting nosings and the stairs do not have adequate handrails.

Additional problems with Old Main include the height of controls such as light switches, doorknobs that are difficult to grasp and turn, faucets and controls for drinking fountains that are not easily operated, and wall-hung utility boxes that are hazardous to visually impaired people.

Fig. 62 This step at the threshold of the main entry could catch the toe of an individual who has a stiff leg or who is wearing a fixed ankle brace, causing the person to fall.

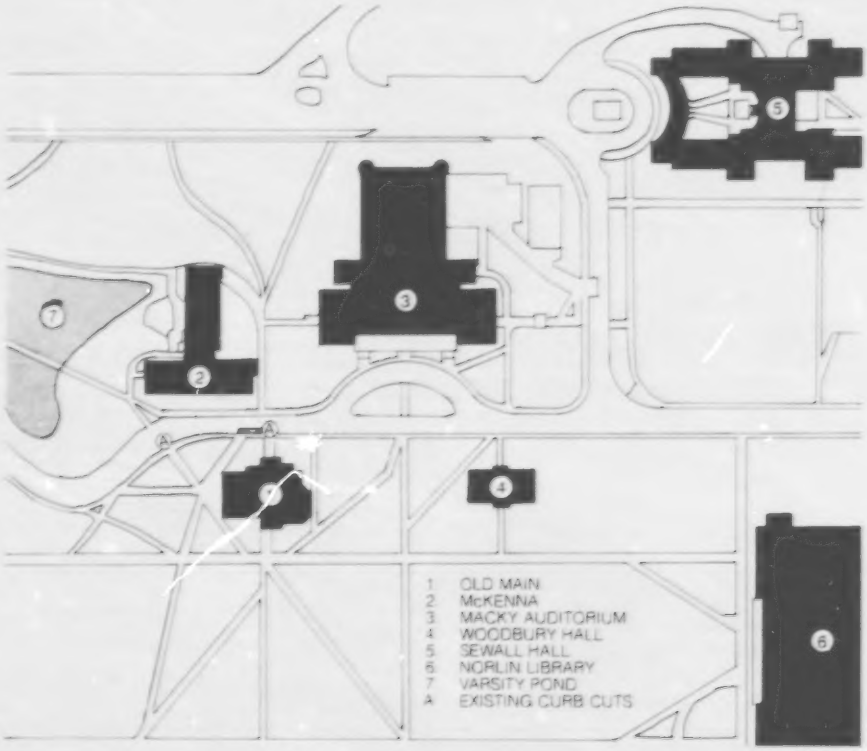


Fig. 61 Campus Plan: University of Colorado

Fig. 63 Stairs are currently the only means of moving between floors.

The Recommended Solution

The student team developed a scheme for accessibility that is sympathetic to both the building and its handicapped users.

1. **Site access** to Old Main would be achieved by reserving an appropriate number of parking spaces on the street adjacent to the building, where curb cuts are already in place.

2. **An accessible entrance** usable by individuals in wheelchairs would be provided at the south entrance (Fig. 64) to Old Main, one of the three prominent entrances and the one most conveniently sited in relation to the main campus. This location also has the least conflict with existing vegetation and walkways.

The accessible entrance would be developed by employing an exterior below-grade ramp into the basement level (Figs. 65 and 67). The ramp was one of two options considered by the student team; the other was a wheelchair lift. Primary rationale for selecting the ramp over the lift involved considerations of energy usage as well as the advantage of a ramp's availability and convenience for all users of the building. The wheelchair lift, in contrast, is usable only by handicapped individuals and thus singles them out by removing them from the mainstream.

The door at this entrance would be fitted with new hardware selected for usability by handicapped people, and the door closers would be replaced with a type that is easier to use.

Although the north entrance would not be accessible to wheelchair users, it would be modified to improve usability for individuals with other disabilities. The wooden step that presents a hazard would be replaced with a stone riser that is similar to the existing stone steps. The scheme also calls for installing an auxiliary, smaller handrail on the exterior stair. Inspection of the existing handrail revealed a series of holes on the underneath side through which a bracket supporting an auxiliary rail can be bolted. Both bracket and auxiliary rail, which would be 1½-inch steel tubing welded to the bracket, would be painted to match the historic black rail.

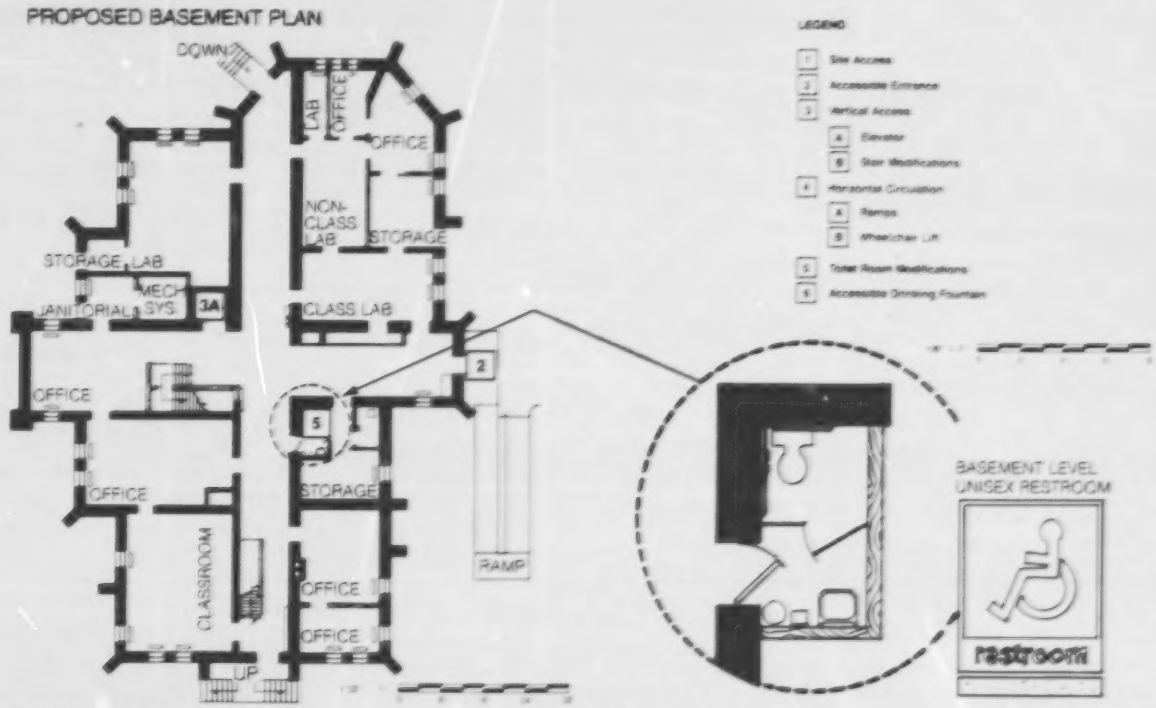
3. **Vertical access** would be provided by installation of an elevator (Figs. 65 and 68) contained within a self-supporting shaft and located at a point convenient to circulation patterns and the accessible entrance. An elevator requiring minimal overhead space for equipment was selected to avoid interference with the roof framing and tie-rods in the attic space. This elevator would have wood-patterned doors and trim compatible with existing woodwork.

Although the student team considered the installation of a powered lift of the type that moves on an inclined plane up the wall of the stairwell, this option was rejected. There were two primary reasons: the adverse visual impact of the mechanism on the stairwell, which is an important architectural element, and the stigma that might be attached to the use of the lift exclusively by handicapped individuals. The elevator would benefit all users of the building, would carry large numbers of passengers rather than the single person carried at one time by the lift, and would be available for transporting freight as well, a function that will become more important if Old Main is transformed into office and exhibit space as is now being considered.

Because the elevator provides an alternate route of access for all handicapped people, the stair risers would not be modified, thus preserving their historic appearance. A new handrail, made of materials compatible with the intact original bannisters and posts, would be installed on the wall side of the hall stairways to increase the safety of all users.

4. **Horizontal circulation** would be improved by widening eight doors that are too narrow; only one door into any given space would be widened in order to minimize

Fig. 64 A proposed ramp on the south elevation would provide access to Old Main at the basement level.



64

Fig. 65 Among accessibility features proposed for Old Main's basement level are the entrance ramp, changes to the entrance door, installation of an elevator and the addition of a unisex rest room.

Fig. 66 The unisex rest room designed by the student team appears above. The Technical Study Group pointed out that the privacy screen would not be necessary if the door locks from the inside.

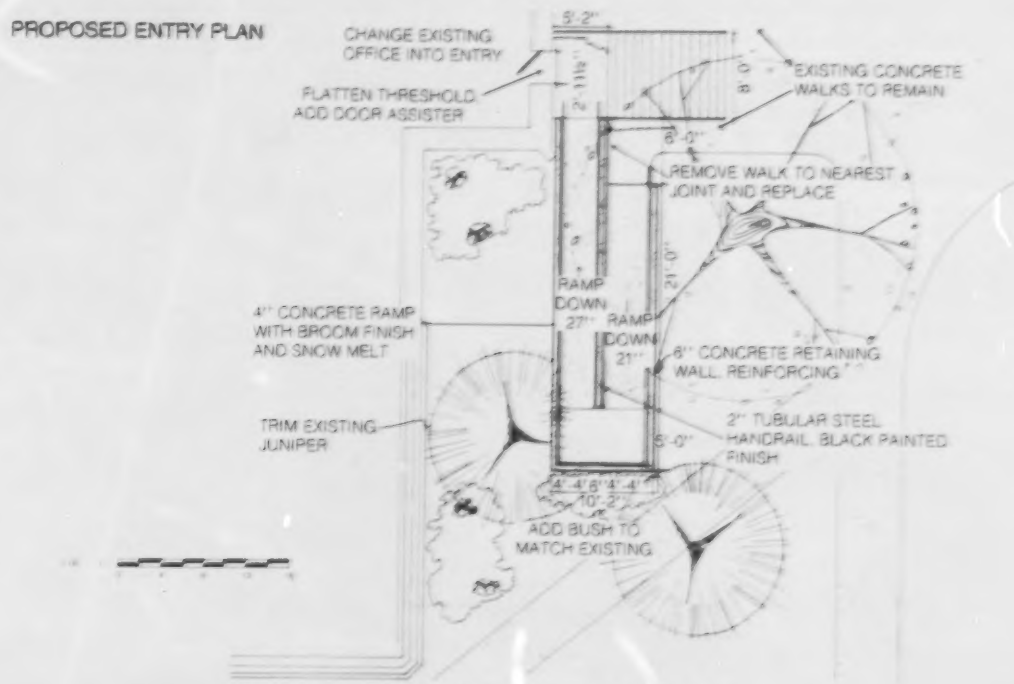


Fig. 67 The entry plan shows the proposed ramp and its relationship to existing walks and vegetation.

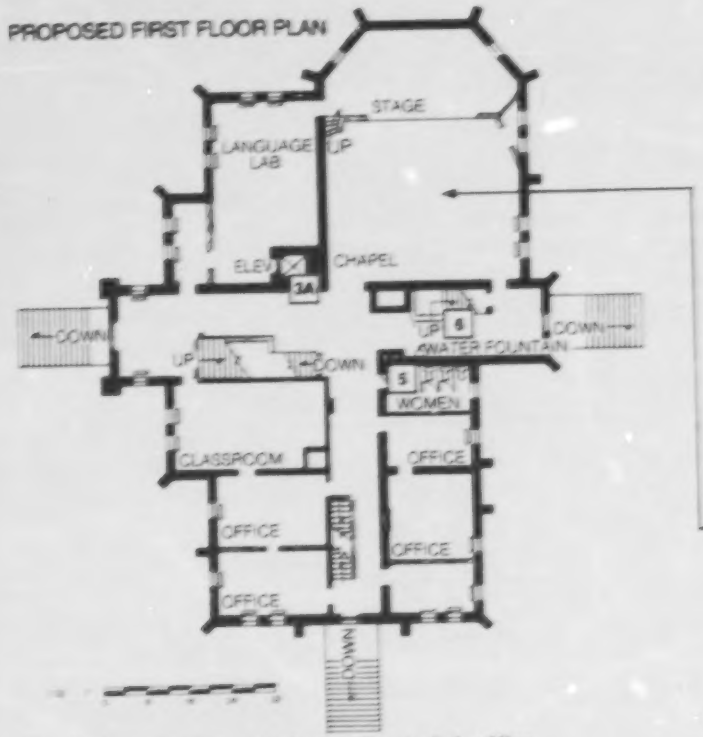


Fig. 68 Proposed changes to the first floor include adding tactile signage, creating accessible seating space for persons in wheelchairs in the Chapel and altering the women's rest room.

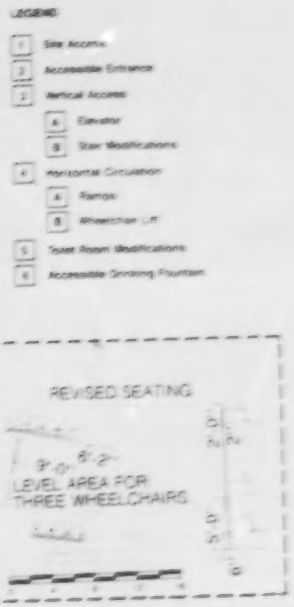


Fig. 70 Four existing seats would be removed on each side of the Chapel to make a level area for three individuals in wheelchairs at both locations.

structural changes. Doorknobs on selected important doors would be replaced with lever hardware.

5. Toilet rooms modified for accessibility would be provided on the basement (Fig. 66), first (Fig. 69) and second levels, with the existing men's room in the basement changed to an accessible unisex room. The first floor women's room and second floor men's room would be enlarged by moving a nonstructural wall in each. This would require the relocation of one door on each floor as well. Grab bars and appropriate signage, including access symbols and Braille symbols, would be installed, and fixtures and accessories would be mounted at appropriate heights (Fig. 69). Existing faucet handles would be replaced with lever controls. Oversize handles would be installed on swing doors.

6. Drinking fountains would be lowered and fitted with new lever controls to make them usable.

7. Signage would include installing Braille signs and access symbols as needed and placing tactile warning strips at the top and bottom of all staircases as a warning to blind persons.

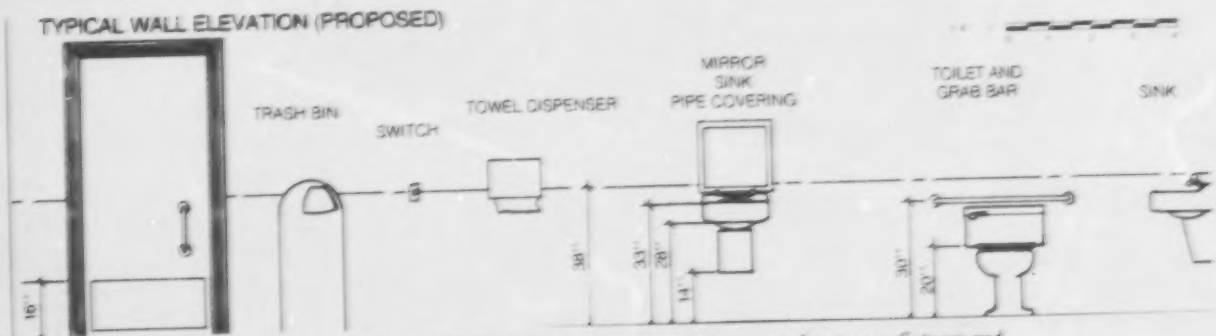


Fig. 69 This typical wall elevation shows the proposed placement of rest room fixtures and accessories.

8. Special spaces or design considerations

- Access to the chapel (Fig. 70) would be accomplished by altering the floor incline on the main level to reduce the uphill slope of the floor. Eleven existing seats at the back of the chapel would be removed to provide a level space for three wheelchairs, reducing seating in the chapel from 308 to 300.
- *Language laboratories* would be furnished with individual lab stations that are accessible to handicapped users. The portable stations could be rearranged to provide necessary maneuvering clearances.
- *Hearing impaired* persons would be served by a sound amplification system in the chapel.
- *Blind and visually impaired* individuals would be assisted in avoiding hazards by enclosing utility boxes and pipes to make them detectable by a long cane.
- *Controls* such as light switches would be lowered.

Technical Study Group Comments

The proposed solution is very much in harmony with the design vocabulary of the building. It is a "sensitive yet simple solution to both historic and accessibility issues, not overblown but developed fully in all areas down to signage and details."

The location selected for the exterior ramp is good, with the asymmetrical element of the ramp being added to the one asymmetrical entrance elevation of the building. The design of the ramp places it away from the building, leaving the original grade at the foundation, which is desirable. The below-grade slope makes the least possible impact on the exterior facade. It was suggested by the reviewers that the ramp design could be improved by using different materials; for example, the ramp could be constructed with cheekwalls of concrete colored to match the sandstone of the basement level. This would blend in with the building and reduce or eliminate the extensive use of unscreened welded steel pipe, as shown in the proposed design.

Reviewers suggested that a curved ramp might be preferable to the rather stiff design of the switchback ramp. Landscaping would also soften this stiffness by complementing the fine old trees with plantings extended around the end of the ramp. Another comment suggested that the stair at this entrance, which is not original, might be pulled out, creating more generous space at the basement entrance.

In another area, one reviewer suggested that the alterations to the chapel could be improved by moving the block of eight removed seats back one row, against the rear wall, so as to lessen the appearance of a hole punched out of the seating layout that is produced by the recommended configuration.

Accessibility issues are generally well worked out. The Technical Study Group members noted that some details were not entirely correct. They identified the proposed placement of grab bars in the rest rooms as a problem, and also suggested that the unisex toilet room would function better with an inside lock on the door, thus eliminating the need for the privacy screen and door inside the room.

The specification of Braille signage was another item pointed out for correction. Tactile signage should employ Arabic numerals and standard alphabet letters, in addition to Braille, since only a minority of visually handicapped people read Braille. Combination plates containing Braille and raised symbols are now available in easily applied units.

It was also noted that the drawings showed the Symbol of Access reversed; the symbol is required to face right unless indicating direction.

On the basis of cost, this design was judged to be reasonable and feasible. The entrance chosen for modification is the one that will be least costly to alter and the elevator, though expensive, is justified because it will serve multiple uses in the building.

However, in terms of strict requirements of Section 504, the solution does go beyond necessary modifications. For example, the one unisex toilet room could suffice without altering an additional toilet room for each sex. In addition, with the installation of an elevator, modifications to the stairs are not mandatory. Since these are the principal architectural features of the interior, potential alterations should be seriously evaluated before implementation.

University of Colorado: An Historical Perspective

The legislature of the Territory of Colorado created the University of Colorado at Boulder in its first session in 1861. When Colorado became a state in 1876, the state constitution established a board of regents to control the University. Then, the University consisted of one building, Old Main, which sat on land donated by three Boulder citizens.

As the University grew, Charles A. Klauder, an architect, was appointed to develop a style for the physical appearance of the University. This design, often called the "Colorado" style, dictated campus growth for many years. The red sandstone facades and red tile roofs still dominate the campus appearance.

The University has grown in a little over 100 years from one building to a campus of 590 acres with 160 buildings. The original student body of 44 has climbed to over 20,000 undergraduate and graduate students who study in the University's 11 schools and colleges.

Acknowledgements

Dwayne C. Nuzum, *Dean*
College of Environmental Design

Spenser C. Havlick, Ph.D.
Assistant Dean
Faculty Coordinator

Advisors:
Department of Physical Plant
Spec Lefler, *Director*
Gail Burley
Sandra Johnson
Mike Jancic

Office of Services to Disabled Students
Homer Page

Dean Reynolds, *Cost Estimator*

DESIGN STUDY 6

Modifying Theatre and Student Union Facilities: University of Notre Dame

The Buildings

Both Washington Hall and LaFortune Student Center (Fig. 71) were designed by Willoughby Edbrooke of Burnham and Edbrooke Architects, Chicago. Edbrooke was also responsible for design of Notre Dame's Administration Building and Sorin Hall, as well as the United States Treasury Building in Washington, D.C. Although of markedly different styles, Washington Hall and LaFortune Student Center are both constructed of yellow brick with limestone trim, the same material used in other campus buildings of the period.

Washington Hall was completed in 1881 in a style termed "modern Gothic" by the architect. Together with Sacred Heart Church, which it parallels in style and proportion, Washington Hall flanks the domed Administration Building and, by its placement, helps to define the "head" of the central quadrangle.

The structure is actually two buildings constructed at the same time but functioning independently. The main theater component is an octagonal arena with upper and lower seating to accommodate 700 spectators. Behind it is the music hall, which houses performing rooms, classrooms, recreation and reading rooms. The main stage of the theater has been the scene of attractions ranging from its opening night bill of Sophocles "Tyrranus" to speakers like William Jennings Bryan and Henry James.

Washington Hall has the distinction of being the only building selected for this design project that is reputed to harbor ghosts. Opinion is divided as to whether the

Fig. 71 The University of Notre Dame studied a building housing a theater, classrooms and workshops, Washington Hall (left); and a student union building, LaFortune Student Center (right).

source of slamming doors on windless nights and footsteps on the roof is the ghost of George Gipp, Notre Dame's famous All-American who once lived in Washington Hall, or whether it is the spirit of a steeplejack who fell to his death from the flyloft in 1886.

Although built only two years later and designed by the same architect, LaFortune Student Center employs a different design vocabulary. One of only two buildings on campus with definite neo-classical elements, LaFortune has been described as a mixture of French medieval with some classical details.

Originally dedicated as the Notre Dame Science Building, LaFortune housed the science section of the University museum as well as classroom, laboratories and apparatus rooms. During its period as the Science Building, and particularly in the early stages of the development of aerodynamics, LaFortune was the scene of important research. The first successful helicopter and wind tunnel were both designed in this building; aerodynamics pioneer Albert Zahm tested his flying machines here in the 1890s; the first manned glider was launched from its roof; and the formula for synthetic rubber was perfected in its chemistry laboratories. In 1895, LaFortune was the site from which Jerome Green became the first American to send a wireless message.

Later modified to serve as a student union, LaFortune now houses student organizations. Since there is no commercial center nearby, it serves as the principal activity center and recreational facility for students.

Both buildings are part of the main north-south quadrangle of the campus which forms its historic center. The architecture of this quadrangle is primarily eclectric Victorian style with buildings distinguished by slightly French silhouettes. In 1977 the area was designated an historic district and was listed on the National Register of Historic Places.

The Problem

Both Washington Hall and LaFortune Student Center share similar problems: principal entrances are above grade, doors are too narrow in many instances, toilet rooms are inaccessible, and there are no elevators for vertical access.

In addition, stairs in Washington Hall have projecting nosings and drinking fountains are too high in LaFortune.

Since Washington Hall is essentially two independent buildings, access to each must be considered separately. In the theater wing, the principal entrance is on the south elevation and is three risers above grade. Inside, there is level access to toilet rooms, offices and workshops. Stairs provide the only means of reaching the theater itself, which has its main level on the second floor and its balcony on the third. The theater (Fig. 72) does not have level seating for spectators in wheelchairs. In addition to the principal entrance, there is one entry at one step above grade that leads into the workshops on the east elevation. The music hall section of Washington Hall has three sets of monumental steps, one each on the north, east and west elevations, in addition to three other entrances that are at or slightly above grade.

LaFortune Student Center has three principal entrances. The formal entrance is on the west elevation and is approached up a flight of stairs. The north-south corridor of the building has doors on either end, both of which are approached by climbing two risers. Immediately inside each of the two doors is a series of steps bringing the corridor up to the level of the main floor. Two other side entrances are on grade level but give entry onto full flights of stairs.

Other significant access problems, in addition to the typical problems noted earlier, include the auditorium, which has no seating for people in wheelchairs, and the interior court, a lightwell in the center of the building that is furnished in the manner of an outdoor courtyard. The court is entered off the Main Hall and is on two levels divided by a set of six risers.

Fig. 72. Access to Washington Hall's theater is provided only by stairs; the main floor of the theater is on the building's second floor.

The Solution

The accessibility plan for these two buildings is a clear reflection of the philosophy stated by the student team:

> The most important guiding principle throughout this project has been to provide barrier-free access throughout, while maintaining the historic and architectural character of each building and at the same time, prohibiting the barrier-free modifications from becoming obvious as to their narrowest intention. The strategy has been to design each barrier-free 'device' as something which serves other uses beyond those of concern to the handicapped. In this way, the handicapped are smoothly integrated into the mainstream of activity without it appearing as though there has been a great effort to do so.

In developing their scheme, the student team considered broader plans for campus development. Washington Hall and LaFortune Student Center flank what is to become the main entrance to the traditional campus from the new campus complex to the east, where the new Memorial Library and dormitory buildings will form a modern adjunct to the historic campus center. In recognition of the role that these two historic buildings and the space be-

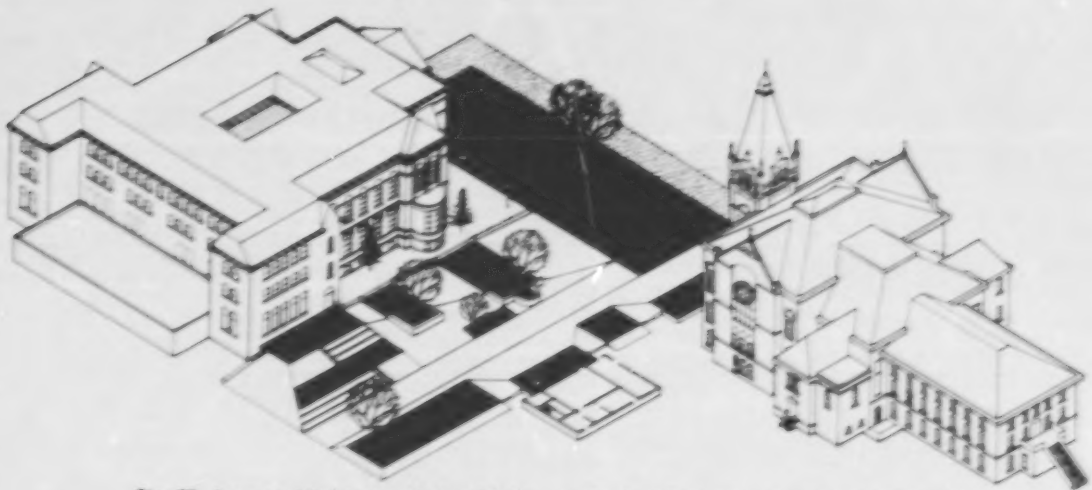


Fig. 73. Access to Washington Hall and LaFortune Student Center is achieved in this proposed design by means of a landscaped raised plaza. Inclined planes and steps serve as transitions between varying levels. The plaza raises the level of the area between the two buildings to create grade level entrances to both.

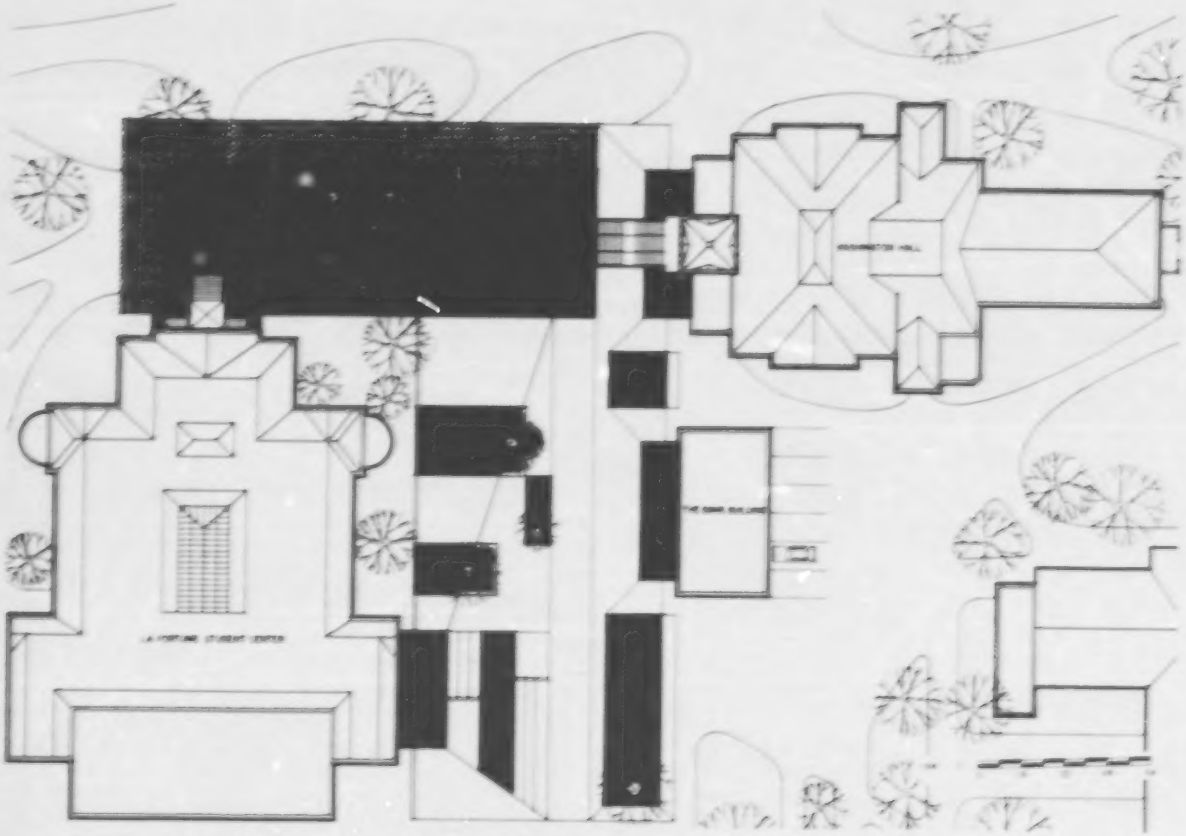


Fig. 74. Shaded areas in this proposed site plan represent level surfaces of the plaza. Steps and sloping surfaces leading to the various levels are unshaded.

tween them will play as the gateway between old and new campuses, the student team designed a terrace (Fig. 73) between the two buildings that would enhance the concept of the space as a processional way and simultaneously would provide access to Washington Hall, LaFortune Student Center and a smaller third building, the Band Hall.

The site access gained by this design will be augmented by accessible entrances, elevators in both buildings and other modifications as required. In listing the elements of the accessibility plan below, site access for both buildings will be discussed as a unit; other aspects of the proposed modifications for Washington Hall will then be presented in detail, followed by the plan for LaFortune. Finally,

70

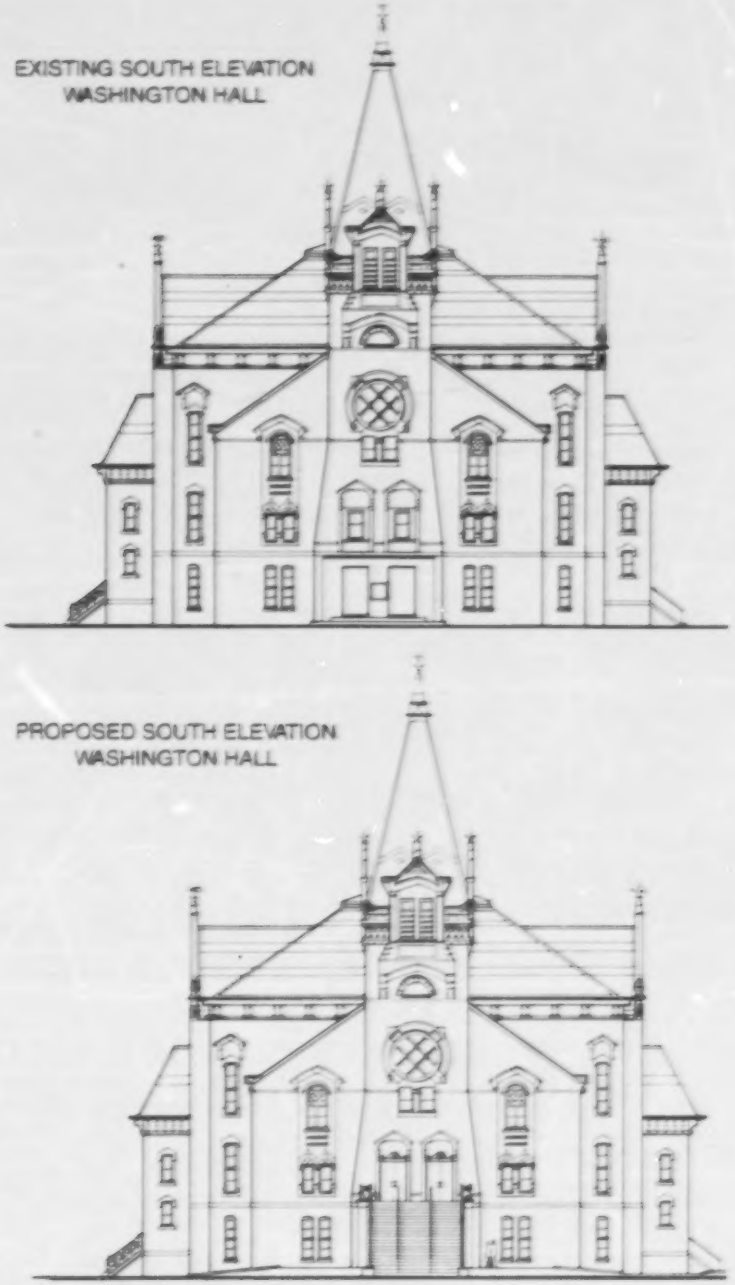
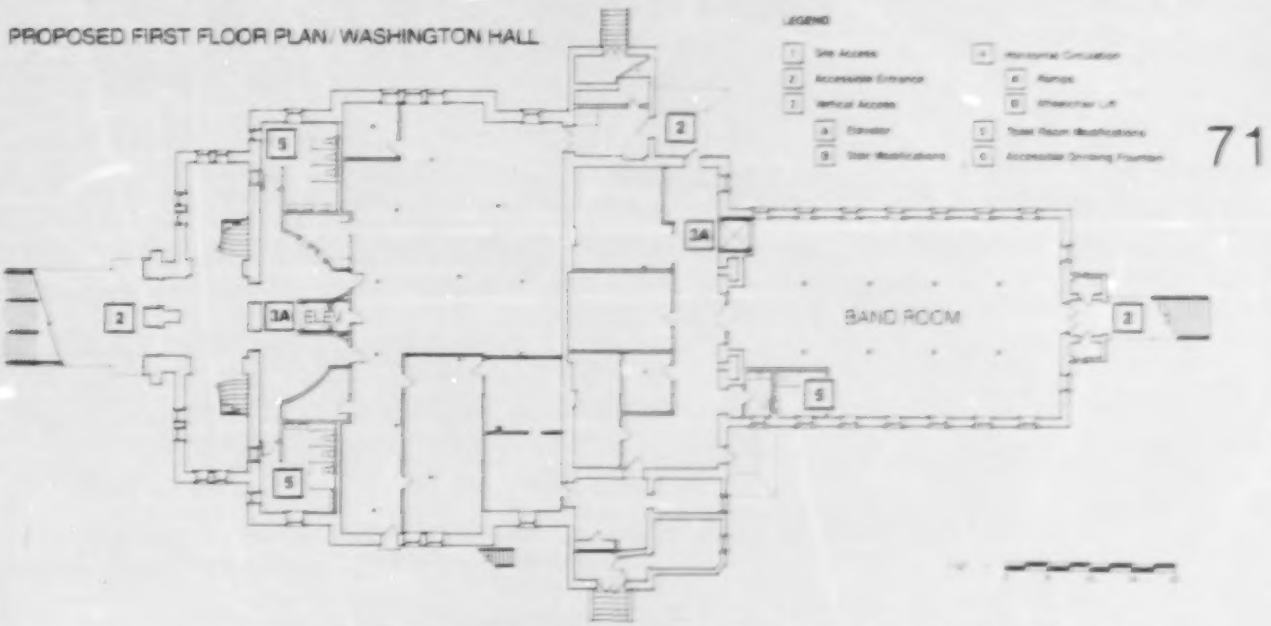


Fig. 75 The student team recommended the restoration of an original staircase on the south elevation, for preservation purposes. Also, the students recommended an accessible grade-level entrance, to be formed by the proposed terrace.

program concepts for both will be discussed. Components of the accessibility plan are:

1. Site access (Figs. 73 and 74) is the centerpiece of this plan. A terrace or landscaped plaza with inclined planes supplemented by steps has been designed to serve multiple purposes.

Steps and sloping surfaces would form transitions between the various levels of the terrace. The whole plaza would raise the level of the ground between the buildings to the first floors of each structure, thereby providing access to principal entrances to the three buildings on its perimeter.



71

Fig. 76. The installation of an elevator in the first floor theatre wing would provide access to seating on the second floor. Rest rooms would be modified to accommodate handicapped people in both theatre and music hall sections of the building. Two entrances to the music hall would be made accessible by the addition of level raised platforms with gradually inclined sides. A second elevator would be required for vertical access in the music hall.

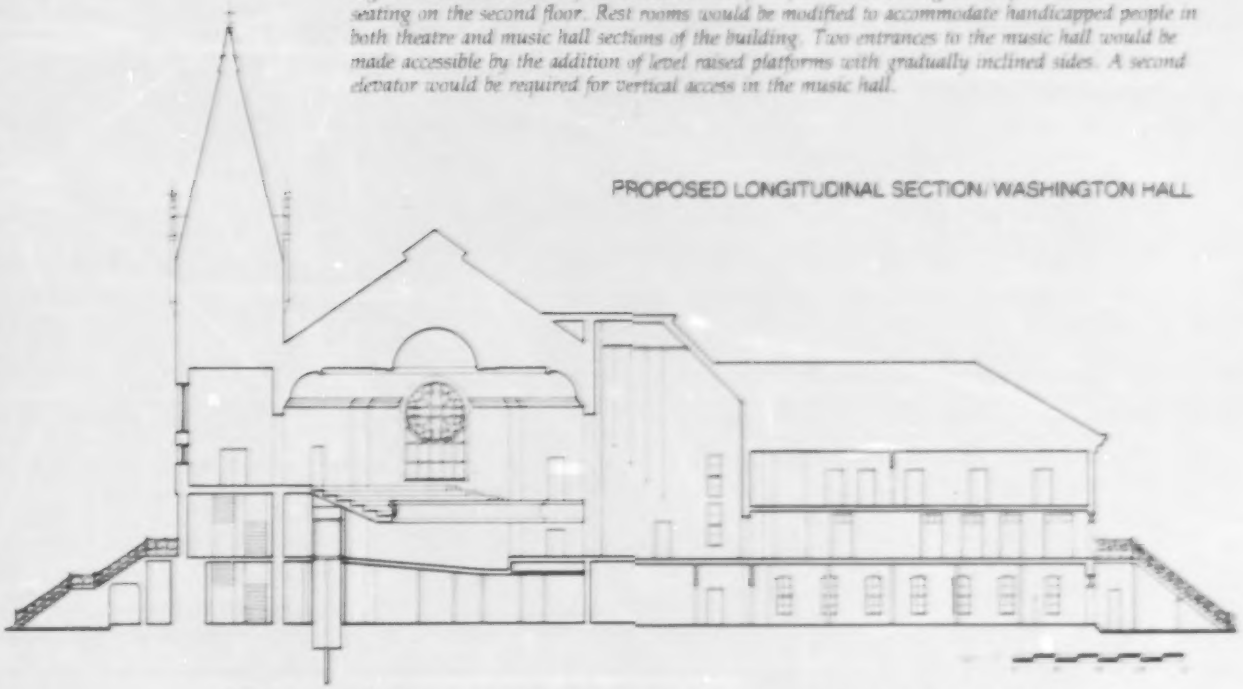


Fig. 77. This longitudinal section of Washington Hall shows the proposed elevator in the theatre wing.

Because access to these buildings is solely pedestrian, there was no need to consider reserved parking spaces or curb cuts in the immediate area.

Washington Hall

2. **The accessible entry** to the theater wing would be through the formal entrance on the south elevation (Fig. 75), with grade level access provided by the terrace. The music hall wing will have two accessible entrances, both on the north elevation (Fig. 76) at the doors closest to grade level. Rather than the standard ramp design, the student team uses an innovative technique similar to the scheme used for the terrace. Doors open onto a level platform tucked into the angles of the building, with inclined planes leading down from the platform on the two exposed sides. The gentle slope of the inclines does not require handrails and the whole system functions as a landing that can be approached from any angle on its open sides.

3. **Vertical access,** as in the case of the entrances, would be provided independently in the two sections of the building by the installation of an elevator in each (Figs. 76, 77 and 79). In the theater wing, the elevator (which serves only the main level of the theater) is located on axis with the principal entrance. In the music hall wing, the elevator on the first floor opens onto the east-west corridor that is the principal circulation route for this section on this level. On subsequent floors, where this corridor does not exist, the elevator opens on the opposite side to feed into the changed circulation pattern. Stairs are also modified to eliminate projecting nosings.

4. **Horizontal circulation** would be improved with widened doors and modified thresholds as required. On all exterior doors, door handles are relocated for better usability and new door closers are installed to reduce the force required for opening. Interior doors are modified similarly where needed.

5. **Toilet rooms** in both sections of the building would be fitted with new toilet stalls and accessories and would have lavatories repositioned for accessibility.

6. **Drinking fountains** in Washington Hall are not a problem.

7. **Signage** was not specifically addressed in this project.

8. **Special spaces**: The theater (Fig. 78) would be made accessible on its main floor by removing some seats to provide a level area in the last row of seats on either side of the house. Because this is a small, intimate theater, the location of the seating should not be a problem. However, should an individual in a wheelchair need a closer seat due to vision or hearing impairment, the aisles slope down to the orchestra and would permit moving a wheelchair to the front.

LaFortune Student Center

2. **An accessible entrance** off the terrace would be developed at the north entry (Fig. 79). The terrace at this point would be at the level of the main floor of the building, thus eliminating the set of steps that break the corridor just inside the entryway. In order to accommodate this change in level from the exterior, the doorway would have to be raised, but the existing arch provides sufficient headroom to raise the door without cutting into the masonry fabric of the building. This entrance is on the north-south corridor that runs the width of the building and provides the circulation core off which other traffic patterns within the building move.

3. **Vertical access** would be provided by a new elevator (Figs. 80 and 81) installed in the interior court. It would be an open cage elevator with decorative wrought iron detailing in the style of the wrought iron balconies that now overlook the court from the upper-level windows. In order to accommodate a cab large enough to be usable by persons in wheelchairs, the flanking windows would be

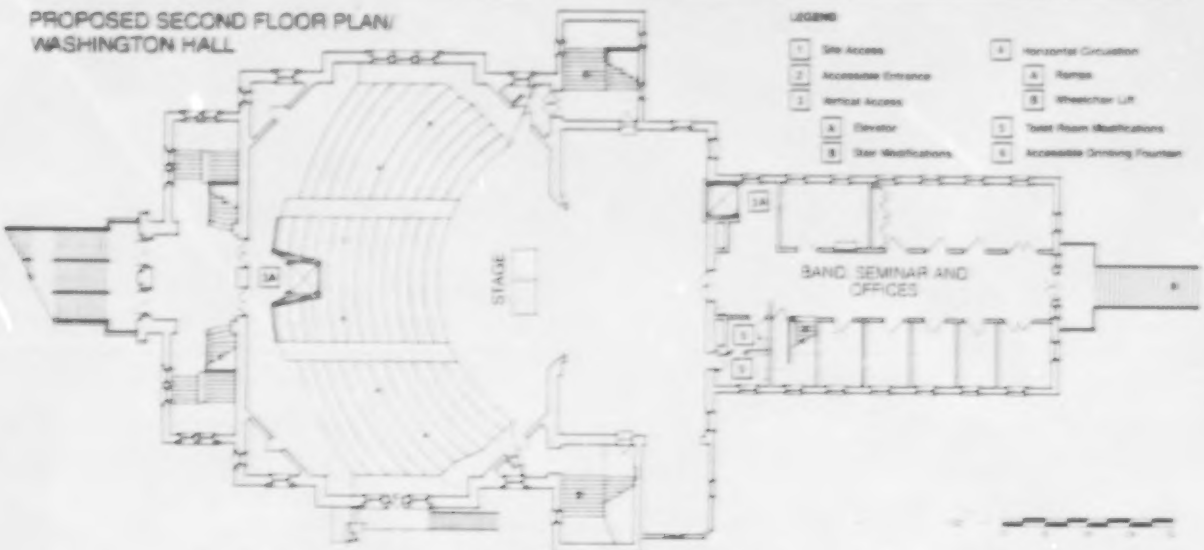


Fig. 78 Changes to the second floor of Washington Hall would include bringing an elevator up through the last three rows of the theater and changing interior partitions in the music hall to create lobby space for the proposed new elevator in that wing.

relocated farther apart. The elevator in this location would be on axis with the accessible entrance and the major public spaces.

4. Horizontal circulation in this scheme (Fig. 80) would be improved by widening doors as needed, modifying thresholds, enlarging vestibules and replacing selected door closers with hardware more easily operable by handicapped people. The interior court, previously inaccessible for approximately two-thirds of its length, would be restored back to basement level, where it presents a level floor throughout.

PROPOSED SOUTH ELEVATION/ LA FORTUNE STUDENT CENTER

Fig. 79. This drawing of the proposed south elevation of LaFortune Student Center shows the proposed system of slopes and level terraces that would lead to the planned accessible entrance.

PROPOSED FIRST FLOOR PLAN/ LA FORTUNE STUDENT CENTER

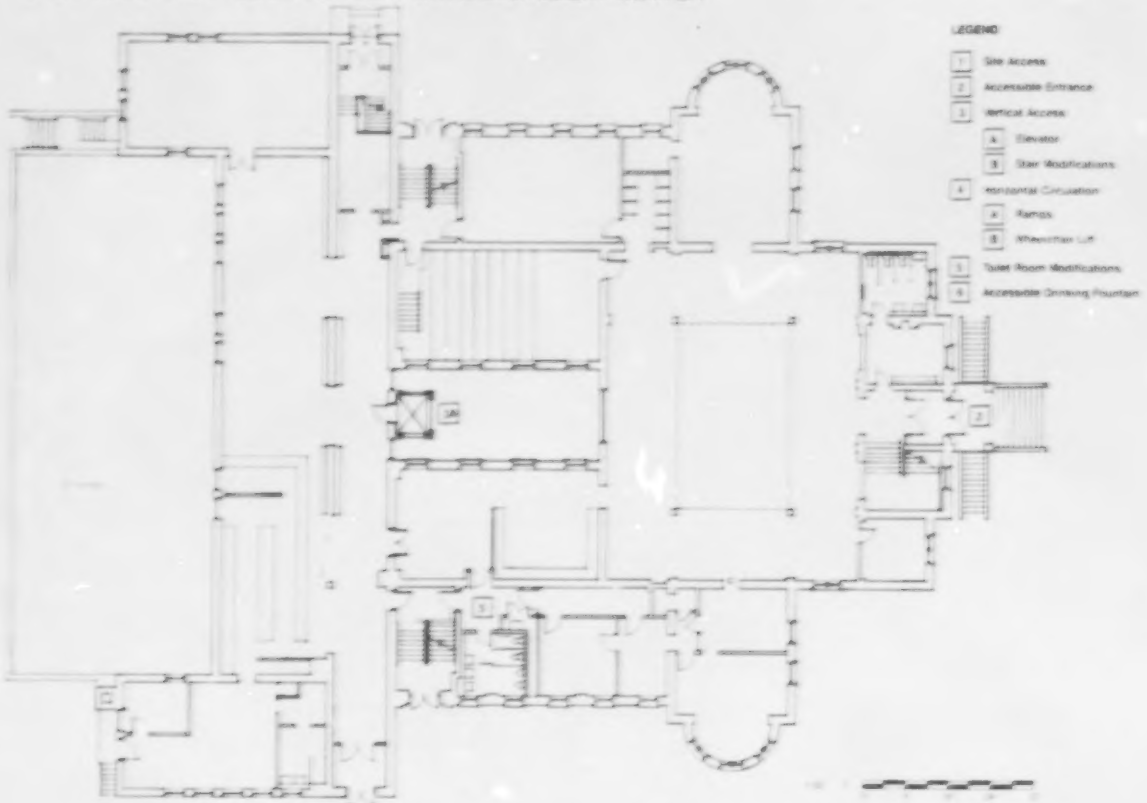
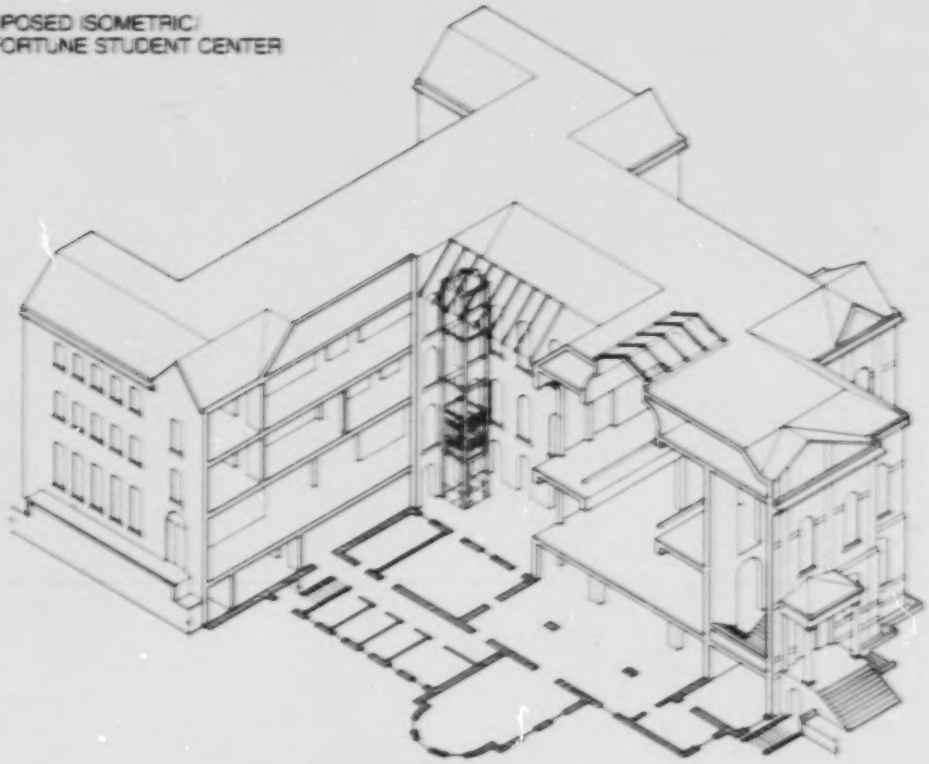


Fig. 80. Proposed accessibility modifications to the first floor of LaFortune Student Center include raising the north entrance door to the level of the inside corridor, thereby eliminating a set of interior steps; altering thresholds, widening doors and changing door closers as needed; modifying rest rooms; and adding an elevator in the interior courtyard.



74

Fig. 81. The proposed isometric drawing of LaFortune Student Center shows the courtyard restored to basement level and the proposed open-cage elevator, as recommended by the student team.

5. Toilet rooms in this building would all be modified as required for accessibility, with new fixtures where needed and existing fixtures remounted at appropriate heights.

6. Drinking fountains would be lowered to make them accessible.

7. Signage was not specifically addressed in this project.

8. Special spaces: The auditorium will have seats removed to provide a level area for at least one wheelchair.

Washington Hall and LaFortune Student Center

9. Additional program concepts

The terrace that distinguishes this plan is not only the key to accessibility for three buildings; it also provides a well defined and inviting pedestrian plaza and affords a forum for social events such as the traditional band concerts before football games. This terrace was conceived by the students as an alternative to the typical complex of ramps and lifts that can develop in some cases into unsightly clutter.

It was also felt by the students that this approach achieves the smoothest integration of handicapped individuals into the movement patterns of the campus population as a whole. The terrace will, in fact, function as a useful space for all, with its accessibility features only an incidental aspect of its use.

An additional benefit of the terrace or plaza was noted by a member of the University's physical plant department, who pointed out that the design of the terrace would permit mechanical snow removal over all the sloped surfaces. Olson also cited another advantage of the LaFortune scheme: no functional space will be taken from the building for the installation of the elevator.

As in some of the other student design projects, this team included in their planning a number of historic restoration elements that should not be considered in evaluating the costs attributable to accessibility. In Washington Hall, these restoration elements include replacing the historic stair on the south elevation and restoring the second floor entrance served by that stair, and restoration of the theater interior to its original decor. In LaFortune Hall, the second floor would be reopened to restore the light well to the first floor from the skylight; the front porch would be restored to its original design; and interior details would be restored throughout.

Technical Study Group Comments

The landscaped plaza is "a bold, ingenious solution to the need for ramping (and) in execution would be low-keyed

. . . would not detract from the buildings." It was suggested by the Technical Study Group that the terrace area would benefit from the use of ground cover or other surfacing that would discourage pedestrian traffic on the steep slopes.

The inclined planes leading to platform landings at the Washington Hall north elevation entrances were also singled out as an original and workable device. "An improvement on typical ramping solutions," one reviewer noted.

The location of the LaFortune elevator in the courtyard was considered a particularly good choice. It was agreed that the character of the court, which is actually a lightwell, would not be adversely affected by the installation of the elevator and the relocation of the windows.

If judged on the basis of cost alone, the plaza scheme would be more expensive than other acceptable solutions. The Washington Hall entrance could be easily ramped, and a below-grade ramp or inclined plane arrangement from the north leading to the door beneath the restored main entrance could provide access to the basement level of LaFortune Student Center at much lower cost. However, if justified on the basis of its role in the overall development of the campus, it is, in the words of one reviewer, "an excellent design."

University of Notre Dame: An Historical Perspective

The University of Notre Dame du Lac was founded on the edge of the Indiana frontier in 1842 by Father Edward Sorin, a priest from LeMans, France. Father Sorin and a small group of religious brothers of the Congregation of the Holy Cross took possession of 542 acres of land surrounding two lakes just north of the small town of South Bend. There, they established a college that the state legislature chartered as a full-fledged, degree-granting university within two years.

Today, the University of Notre Dame has about 8,000 students. From Father Sorin's frontier institution has grown a university with international standing as a center of learning and research. Foreign branch programs are active in eight other countries.

The campus consists of a historic complex of quadrangles beginning at the southern edge of a lake. A new campus area consisting of predominantly highrise buildings is located to the east of the historic complex. Father Sorin laid out the historic campus with an axis, reinforced by a tree-lined street, running from the town of South Bend to the gold-domed Administration Building at the north end of the campus. The intersection of this principal axis with a cross-axis creates a cruciform ground plan. In Father Sorin's original plan, all functions of daily living, including spiritual life, were located on the west of the quadrangle, and all academic buildings were on the east. Sacred Heart Church on the west of the Administration Building and Washington Hall on the east formalized this pattern. Father Sorin's plan was followed into the early twentieth century.

The University of Notre Dame Design Team (left to right): Kenneth Richmond, Brian Cheatle, Steve Nilles, Mark Stankard, Karen Tierney and Hugh Campbell.

Acknowledgements

Robert L. Amico, *Chairman*
School of Architecture
Project Administrator

Norman Crowe, *Assistant Professor*
Project Coordinator and Faculty Advisor

Esmee Bellalta, *Associate Professor*
Jaime Bellalta, *Professor*
Faculty Advisors

SUMMARY

The Student Projects

76

Each of the design projects exhibits, in varying degrees, a basic understanding of and sympathy with the special requirements of an accessible environment. The expressed concern for providing accessibility in a manner that integrates the handicapped individual with the other users of the building represents the essence of the philosophy behind the accessibility movement itself, and suggests that the future buildings designed by these young architects will be centered on the actual needs of the real people who will inhabit them. In each of these studies, human needs are recognized as an implicit criterion, along with aesthetic and functional considerations.

At the same time, respect for historic structures is equally evident. Appreciation of the unique aspects of each building under study was manifest in the care with which significant elements were handled.

All of the projects shared many common details. Elevators are seen as the only practical solution to moving handicapped people vertically in multistory buildings, yet each of the teams was quick to note that the elevator in their own structure was needed for other purposes and would benefit all the users of the building. Wheelchair lifts were found to be the best solution for situations where changes in level were less than a full story and there was no room for a ramp, but their status as a "special device" that removed the handicapped person from the flow of traffic made the students wary of specifying them unless there was no alternative. Historic entrances and architecturally rich interior spaces were diligently preserved, and the design teams just as diligently arranged their plans so that handicapped people could experience those elements as much as possible. While actual use of the grand staircase may be out of the question for an individual in a wheelchair, it is possible to make the stair visually accessible.

It is interesting to note that a number of the buildings included in this project are slated for rehabilitation and renovation in the next few years. The student teams have clearly shown that these buildings can be restored to efficient utilization while preserving their significant architectural characteristics and making them fully accessible to future handicapped users. If final plans reflect the same level of concern and understanding, each of the buildings will have reached another step in the evolution of its useful life.

PART 3

Appendices

APPENDIX A

State Historic Preservation Officers

78

Alabama
Director, Alabama Department of Archives and History
Chairman, Alabama Historical Commission
Archives and History Building
Montgomery, AL 36104

Alaska
Chief of History and Archeology
Division of Parks
Department of Natural Resources
619 Warehouse Ave., Suite 210
Anchorage, AK 99501

American Samoa
Territorial Historic Preservation Officer
Department of Public Works
Government of American Samoa
Pago Pago, American Samoa 96799

Arizona
Chief, Natural and Cultural Resource Conservation Section
Arizona State Parks
1688 West Adams
Phoenix, AZ 85007

Arkansas
Director, Arkansas Historic Preservation Program
Suite 500, Continental Building
Markham and Main Sts.
Little Rock, AR 72201

California
Office of Historic Preservation
California Department of Parks & Recreation
P.O. Box 2390
Sacramento, CA 95811

Colorado
State Historic Preservation Officer
Colorado Heritage Center
1300 Broadway
Denver, CO 80203

Connecticut
Director, Connecticut Historical Commission
59 South Prospect St.
Hartford, CT 06106

Delaware
Director, Division of Historical and Cultural Affairs
Hall of Records
Dover, DE 19901

District of Columbia
Director, Department of Housing and Community Development
1325 G St., NW
Washington, DC 20005

Florida
Deputy Secretary of State
The Capitol, 401 East Gaines St.
Tallahassee, FL 32304

Georgia
Chief, Historic Preservation Section
Department of Natural Resources
270 Washington St., SW, Room 703-C
Atlanta, GA 30334

Guam
Director of Parks and Recreation
Government of Guam
P.O. Box 682
Agana, Guam 96910

Hawaii
State Historic Preservation Officer
Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI 96809

Idaho
Historic Preservation Coordinator
Idaho Historic Society
610 North Julia Davis Dr.
Boise, ID 83706

Illinois
Director, Department of Conservation
607 State Office Building
400 South Spring St.
Springfield, IL 62706

Indiana
Director, Department of Natural Resources
608 State Office Building
Indianapolis, IN 46204

Iowa
Director, Iowa State Historical Department
Division of Historic Preservation
26 East Market St.
Iowa City, IA 52240

Kansas
Executive Director, Kansas State Historical Society
120 West 10th St.
Topeka, KS 66612

Kentucky
Director, Kentucky Heritage Commission
104 Bridge St.
Frankfort, KY 40601

Louisiana
Assistant Secretary, Office of Program Development
P.O. Box 44247
Baton Rouge, LA 70804

Maine
Director, Maine Historic Preservation Commission
31 Western Ave.
August, ME 04330

Maryland
State Historic Preservation Officer
John Shaw House
21 State Circle
Annapolis, MD 21401

Massachusetts
Executive Director, Massachusetts Historical Commission
294 Washington St.
Boston, MA 02108

Michigan
Director, Michigan History Division
Department of State
Lansing, MI 48918

Minnesota
Director, Minnesota Historical Society
690 Cedar St.
St. Paul, MN 55101

Mississippi
Director, State of Mississippi
Department of Archives and History
P.O. Box 571
Jackson, MS 39205

Missouri
State Historic Preservation Officer
State Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65101

Montana
Director, Montana Historical Society
225 North Roberts St.
Veterans Memorial Building
Helena, MT 59601

Nebraska
Director, The Nebraska State Historical Society
1500 R St.
Lincoln, NE 68508

Nevada
State Historic Preservation Officer
Division of Historic Preservation and Archeology
Capitol Complex
Carson City, NV 89710

New Hampshire
Commissioner, Department of Resources and Economic Development
P.O. Box 846
Concord, NH 03301

New Jersey
Commissioner, Department of Environmental Protection
P.O. Box 1420
Trenton, NJ 08625

New Mexico
State Historic Preservation Officer
New Mexico Historic Preservation Program, Department of Education, Finance and Cultural Affairs
c/o New Mexico State Library
P.O. Box 1629
Santa Fe, NM 87503

New York
Commissioner, Parks and Recreation
Agency Building #1, Empire State Plaza
Albany, NY 12238

North Carolina
Director, Division of Archives and History
Department of Cultural Resources
109 East Jones St.
Raleigh, NC 27611

North Dakota
Superintendent, State Historical Society of North Dakota
Liberty Memorial Building
Bismarck, ND 58501

Northern Mariana Islands
Historic Preservation Officer
c/o Department of Community and Cultural Affairs
Commonwealth of Northern Mariana Islands
Saipan, Mariana Islands 96950

Ohio
Director, The Ohio Historical Society
Interstate 71 at 17th Ave.
Columbus, OH 43211

Oklahoma
State Historic Preservation Officer
235 Pasteur Building
1111 North Lee
Oklahoma City, OK 73103

Oregon
State Parks Superintendent
525 Trade St. SE
Salem, OR 97310

Pennsylvania
Pennsylvania Historical and Museum Commission
P.O. Box 1026
Harrisburg, PA 17120

Commonwealth of Puerto Rico
Institute of Puerto Rico Culture
Apartado 4184
San Juan, PR 00905

Rhode Island
Director, Rhode Island Department of Community Affairs
150 Washington St.
Providence, RI 02903

South Carolina
Director, State Archives Department
1430 Senate St.
Columbia, SC 29211

South Dakota
State Historic Preservation Officer
Historical Preservation Center
University of South Dakota
Alumni House
Vermillion, SD 57069

Tennessee
Executive Director, Tennessee Historical Commission
170 Second Ave., N, Suite 100
Nashville, TN 37219

Texas
Executive Director, Texas State Historical Commission
P.O. Box 12276, Capitol Station
Austin, TX 78711

Trust Territory of The Pacific Islands
Historic Preservation Officer, Land Resources Branch
Department of Resources & Development, TTPI
Saipan, Mariana Islands 96950

Utah
Executive Director, Department of Development Services
Room 104, State Capitol
Salt Lake City, UT 84114

Vermont
Director, Vermont Division for Historic Preservation
Pavilion Office Building
Montpelier, VT 05602

Virginia
Virginia Historic Landmarks Commission
221 Governor St.
Richmond, VA 23219

Virgin Islands
Planning Director, Virgin Islands Planning Board
Charlotte Amalie
St. Thomas, VI 00801

Washington
State Historic Preservation Officer
111 West 21st Ave., KL-11
Olympia, WA 98504

West Virginia
State Historic Preservation Officer
Historic Preservation Unit
Department of Culture and History
State Capitol Complex
Charleston, WV 25305

Wisconsin
Director, State Historical Society of Wisconsin
816 State St.
Madison, WI 53706

Wyoming
Director, Wyoming Recreation Commission
604 East 25th St. Box 309
Cheyenne, WY 82001

National Trust for Historic Preservation
President, National Trust for Historic Preservation
740 Jackson Pl., NW
Washington, DC 20006

APPENDIX B

California State Historical Building Code

80 CHAPTER 8-13.
ALTERNATIVE HANDICAPPED PROVISIONS

Detailed Analysis

Section
8-1300 Basic Provisions
8-1301 Intent
8-1302 Scope
8-1303 Purpose
8-1304 Application
8-1305 Accessibility Features
8-1306 Exemptions

8-1300. Basic Provisions.

(a) The provisions of this chapter, as set forth in the table below, are hereby adopted for the purpose of providing the basic construction regulations relating to alternative handicapped provisions.

(b) The following table identifies those sections of this part which have been adopted by the listed agencies. See Section 8-104 for explanation of the application of these regulations and their intended use.

TABLE NO. 8-13A

Code Section	HCD 1	HCD 2	SFM	OSA SSS	OSA HC	OSH PD	DHS	OSHA	CEC	SHB	DOT	AGR	YA	BOC	DOE	CA
Entire Chapter	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—

The above table is provided for the benefit of the user and is for information only.

NOTE: Authority cited: Section 18959.5, Health and Safety Code. Reference: Sections 18950-18960, Health and Safety Code.

HISTORY:

1. Repealer of Chapter 8-13 (Sections 8-1300 through 8-1308) and new Chapter 8-13 (Sections 8-1300 through 8-1306) filed 10-17-79; effective thirtieth day thereafter (Register 79, No 42). For prior history, see Register 79, No. 34.

8-1301. Intent.

It is the intent of this chapter to establish guidelines that facilitate access and use by the physically disabled to and in qualified historical structures or sites open to the public, while maintaining the significant historical fabric or historical aspects of such structures or sites.

NOTE: Authority cited: Sections 18950-18960, Health and Safety Code. Reference: Sections 18950-18960, Health and Safety Code.

8-1302. Scope.

Every qualified historical structure or site open to the public shall provide access to the handicapped in conformance with prevailing standards or in conformance with alternative provisions as provided by this chapter.

NOTE: Authority cited: Sections 18950-18960, Health and Safety Code. Reference: Sections 18950-18960, Health and Safety Code.

8-1303. Purpose.

It is the purpose of this chapter to insure that qualified historical buildings comply with prevailing provisions for access by the disabled unless such compliance will destroy the historical fabric or historical aspects of the structure or site.

If the historical fabric or aspect is threatened by strict compliance with such provisions for access by the disabled, the authority charged with enforcement of prevailing code may authorize alternative standards or methods as provided by this chapter to assure reasonably equivalent access and use, and in extreme situations exemptions from the provisions of access if specified conditions are met. Reasonably equivalent access means entrance and use of a facility by people with disabilities using standards and measurements which differ from prevailing provisions for access and which are individually tailored to the historical building or site.

NOTE: Authority cited: Sections 18950-18960, Health and Safety Code. Reference: Sections 18950-18960, Health and Safety Code.

8-1304. Application.

Prevailing provisions for access by the disabled shall be applied to qualified historical buildings unless it is determined that strict compliance with such provisions will destroy the historical fabric or historical aspects of the structure or site. If the historical fabric or historical aspects are threatened, alternative provisions for access may be applied pursuant to this chapter provided the following conditions are met:

TABLE 8-13-1

GUIDELINES TO ALTERNATIVE ACCESS STANDARDS

(FOR LISTED ALTERNATIVES UNDER HEADINGS A THRU D, SEE TABLE 8-13-2)

Instructions: 1. Determine building category, i.e., II.D. under Building Type and Scale of Historicity.
2. Go to box in category under situation headings.
3. Numbers in box refer to list of suggested alternatives under that situation heading, Table 8-13-2.

Use Notes:
1. Listed alternatives only apply to building requiring construction permits.
2. These alternatives should be used only where it is not possible to meet prevailing code.
3. Alternatives should be used only in those portions of the building that are actually historical or are a facsimile of the original historical building.
4. Alternatives apply to access to the physically disabled (in wheelchairs).
5. Alternatives apply to qualified historical buildings only.
6. For other handicapped standards, see State Architect's guideline regulations.
7. Alternatives are listed in priority order.
8. No alternatives are allowed for simulations.

	SITUATION HEADINGS			
	ENTRY	DOORS	TOILET ROOMS	FLOORS & LEVELS
	Prevailing Codes:	**Prevailing Codes:**	**Prevailing Codes:**	**Prevailing Codes**
	Primary public entrance with access to elevators available	—32" clear openings —5' level perpendicular to closed door —1' clear at strike side (minimum)	—"S" = 5' stall-clear "Length 32" Min. + water closet 60" preferred Width 36" Min. 42" preferred Door 32" clear Turn 60" Dia. Circle Lavy. 25" clear under For newly designed space, see prevailing code.	—Access to all floors except in offices, retail shops —Floor on given story level or ramped
Category (Facility Type and Scale of Historicity)	**Alternatives**	**Alternatives**	**Alternatives**	**Alternatives**
I. Publicly owned or leased building providing governmental services to general public (i.e., City Hall, Courthouse, etc.); adaptive use, restoration or reconstruction.				
A. Interior nonhistorical, Exterior (shell) Historical all or part.	2, 4	1, Exterior only None interior	None	N.A.
B. Interior historical — all or part, Exterior nonhistorical.		1, 2 Interior only None exterior	1, 3	1, 2
C. All historical — Major change in use, change in occupancy.	2, 4	1, Exterior 1, 2 Interior only	1, 3	1, 2
D. All historical — Minor change in use to equal or less intensive occupancy. Limited services.	2, 4	1, Exterior 1, 2, Interior only	1, 3	1, 2
II. Privately owned buildings offering services to consumers (i.e., saloons, restaurants, general shops, etc.) or buildings owned by government and leased or consigned to private operator.				
A. Adaptive use restoration, reconstructions, Interior nonhistoric, Exterior historical (all or part).	1, 2, 3, 4	1, Exterior, and 1, Interior	None	N.A.
B. Interior historical — all or part, Exterior nonhistorical.		None exterior. 1, 2 interior.	1, 2, 3	N.A.
C. All historical — major change in use, change in occupancy, or mixed occupancy. Minor change of use to equal or less intensive occupancy.	1, 2, 3, 4	1, 2, 3	1, 2, 3	1, 2, 3
D. Reconstruction, restoration or facsimile. No change in use except to museum. (Minor mixed occupancy with administration space would be allowed.	1, 2, 3, 4	1, 2, 3	1, 2, 3	1, 2, 3
E. Museum quality restoration and/or reconstruction including museum use. (Minor mixed occupancy compatible with that use would be allowed). Also includes renovation of prime quality historical building or site.	1, 2, 3, 4	1, 2, 3	1, 2, 3	1, 2, 3
III. Privately or publicly owned buildings used as museums or as site for display of the building itself (i.e., museum, schoolhouse, garden centers, galleries, etc.).				
A. Reconstruction, restoration or facsimile. No change in use except to museum. (Minor mixed occupancy such as administrative would be allowed.)	1, 2, 3, 4	1, 2, 3	1, 2, 3	1, 2, 3
B. Museum quality restoration and/or reconstruction museum use. (Minor mixed occupancy compatible with that would be allowed.) Also includes renovation of prime quality historical building or site.	1, 2, 3, 4	1, 2, 3	1, 2, 3	1, 2, 3
IV. Privately owned buildings not open to general public but employing 3 or more persons (i.e., business offices).				
A. Adaptive use — Interior nonhistorical, Exterior historical — all or part.	1, 2, 3, 4	1, 2, 3, Exterior. None interior	1, 2	1, 2, 3, Exterior Access. None interior access
B. Adaptive use — Interior historical, Exterior nonhistorical.	1, 2, 3, 4	None exterior. 1, 2, 3, interior	1, 2	None Exterior access. 1, 2, 3 interior access
C. All historical — major change in use, change in occupancy or mixed occupancy. Minor change of use to equal or less intensive occupancy.	1, 2, 3, 4	1 through 3	1, 2	1, 2, 3
D. Reconstruction, restoration or facsimile. No change in use — except to museum. (Minor mixed occupancy such as administrative would be allowed.)	1, 2, 3, 4	1 through 3	1, 2	1, 2, 3
V. Buildings employing less than 3 people.	All alternatives 1, 2, 3, 4	All alternatives 1-3	All alternatives 1-3	All alternatives 1-3

(a) such alternative provisions shall be applied only on an item-by-item or case-by-case basis. (see Table 8-13-1)

(b) the alternative standards are applied according to the priorities outlined in Table 13-2 whereby the alternative providing the most access is listed first.

(c) the official charged with enforcement of the standards shall provide written documentation stating the reasons for the application of the alternative standards. Such statement should include the opinion and/or comments of a representative local group of disabled people and shall be available to the public on request.

NOTE: Authority cited: Sections 18950-18960, Health and Safety Code. Reference: Sections 18950-18960, Health and Safety Code.

8-1305. Accessibility Features.

Accessibility features in qualified historical buildings or sites including lifts shall be compatible so as not to disturb the historical fabric or historical aspects of the building. Adequate sign instruction shall be posted to indicate building access and their locations, and to assure their safe use.

NOTE: Authority cited: Sections 18950-18960, Health and Safety Code. Reference: Sections 18950-18960, Health and Safety Code.

8-1306. Exemptions.

If the historical fabric or aspect would be destroyed by the application of alternative access standards as provided by this chapter, an exemption from the literal requirements for full and equal access or any alternative provisions may be provided only if the following conditions are met.

(a) such exemption is considered only on an item-by-item or case-by-case basis.

(b) interpretive exhibits and/or equal services of the exempted significant historical aspects are provided for the public in a location fully accessible to and usable by the disabled, including people with hearing and sight impairment.

(c) services must be provided in an accessible location equal to those provided in the exempted location.

(d) the official charged with enforcement of the standards shall provide writte.. documentation stating the reasons for the consequent exemption. Such statement shall include the opinion and/or comments of a representative local group of disabled people and shall be available to the public on request.

NOTE: Authority cited: Sections 18950-18960, Health and Safety Code. Reference: Sections 18950-18960, Health and Safety Code.

TABLE 8-13-2

Alternatives List

These alternatives are listed in order of priority.

Entry:

1. Ramp at greater than standard slope, but no greater than 1:9 for a horizontal distance not to exceed 12 feet at main, side, or rear entrance.
2. Access, listed in the order of priority, at grade or by ramp or lift to any entrance used by general public and no further than 200 feet from primary entrance.
3. Ramp no greater than 1:6 slope for a distance not to exceed a horizontal distance of 2 feet at main, side, or rear entrance.
4. Access, listed in the order of priority, at grade, or by ramp, or lift at any entrance not used by general public but open, (unlocked) with directional signs at primary entrance and no further than 200 feet from primary entrance.

Doors: (one means of entry into spaces requiring access)

1. 30-inch width of clear opening operable by single motion.
2. Usable 29½ inches clear opening with door(s) operable by single motion.
3. Single or double door to provide a usable 29½ inches clear opening.

Toilet Rooms:

1. Toilet facility of dimensions no less than those provided in the prevailing provisions for access and designated as a unisex toilet for the handicapped and General Public.
2. Accessible and usable toilet meeting prevailing code within 200 feet of building.
3. No toilet for anyone.

Floors and Levels (Multihandicapped)

1. Access to experiences, services, functions and materials and resources (i.e., maps, plans, courtroom, council chambers, etc.) at accessible levels.
2. Access provided to levels and floors by ramps of greater than standard slope and no greater than 1:9 for horizontal distances not to exceed 12 feet. Lifts may be provided.
3. Access provided to levels and floors by ramps of 1:6 slope for horizontal distance not to exceed 2 feet. Adequate warnings shall be provided to indicate steepness of the slope.

APPENDIX C

Section 504 Regulations and Analysis Concerning Existing Facilities

Department of Health, Education and Welfare Regulations Implementing Section 504 of the Rehabilitation Act of 1973, Effective June 3, 1977

Subpart C – Program Accessibility

Analysis: *In general, Subpart C prohibits the exclusion of qualified handicapped persons from federally assisted programs or activities because a recipient's facilities are inaccessible or unusable.*

§84.21 DISCRIMINATION PROHIBITED

No qualified handicapped person shall, because a recipient's facilities are inaccessible to or unusable by handicapped persons, be denied the benefits of, be excluded from participation in, or otherwise be subjected to discrimination under any program or activity to which this part applies.

§84.22 EXISTING FACILITIES

(a) *Program accessibility.* A recipient shall operate each program or activity to which this part applies so that the program or activity, when viewed in its entirety, is readily accessible to handicapped persons. This paragraph does not require a recipient to make each of its existing facilities or every part of a facility accessible to and usable by handicapped persons.

(b) *Methods.* A recipient may comply with the requirement of §84.22(a) through such means as redesign of equipment, reassignment of classes or other services to accessible buildings, assignment of aides to beneficiaries, home visits, delivery of health, welfare, or other social services at alternate accessible sites, alteration of existing facilities and construction of new facilities in conformance with the requirements of §84.23, or any other methods that result in making its program or activity accessible to handicapped persons. A recipient is not required to make structural changes in existing facilities where other methods are effective in achieving compliance with §84.22(a). In choosing among available methods for meeting the requirement of §84.22(a), a recipient shall give priority to those methods that offer programs and activities to handicapped persons in the most integrated setting appropriate.

Analysis: 20. Existing facilities: *Section 84.22 maintains the same standard for nondiscrimination in regard to existing facilities as was included in the proposed regulation. The section states that a recipient's program or activity, when viewed in its entirety, must be readily accessible to and usable by handicapped persons. Paragraphs (a) and (b) make clear that a recipient is not required to make each of its existing facilities accessible to handicapped persons if its program as a whole is accessible. Accessibility to the recipient's program or activity may be achieved by a number of means, including redesign of equipment, reassignment of classes or other services to accessible buildings, and making aids available to beneficiaries. In choosing among methods of compliance, recipients are required to give priority consideration to methods that will be consistent with provision of services in the most appropriate integrated setting. Structural changes in existing facilities are required only where there is no other feasible way to make the recipient's program accessible.*

Under §84.22 a university does not have to make all of its existing classroom buildings accessible to handicapped students if some of its buildings are already accessible and if it is possible to reschedule or relocate enough classes so as to offer all required courses in accessible facilities. If sufficient relocation of classes is not possible using existing facilities, enough alterations to ensure program accessibility are required. A university may not exclude a handicapped student from a specifically requested course offering because it is not offered in an accessible location, but it need not make every section of that course accessible.

Commenters representing several institutions of higher education have suggested that it would be appropriate for one postsecondary institution in a geographical area to be made accessible to handicapped persons and for other colleges and universities in that area to participate in that school's program, thereby developing an educational consortium for the postsecondary education of handicapped students. The Department believes that such a consortium, when developed and applied only to handicapped persons, would not constitute compliance with §84.22, but would discriminate against qualified handicapped persons by restricting their choice in selecting institutions of higher education and would, therefore, be inconsistent with the basic objectives of the statute.

Nothing in this regulation, however, should be read as prohibiting institutions from forming consortia for the benefit of all students. Thus, if three colleges decide that it would be cost-efficient for one college to offer biology, the second physics, and the third chemistry to all students at the three colleges, the arrangement would not violate Section 504. On the other hand, it would violate the regulation if the same institutions set up a consortium under which one college undertook to make its biology lab accessible, another its physics lab, and a third its chemistry lab, and under which mobility-impaired handicapped students (but not other students) were required to attend the particular college that is accessible for the desired courses.

Similarly, while a public school district need not make each of its buildings completely accessible, it may not make only one facility or part of a facility accessible if the result is to segregate handicapped students in a single setting.

All recipients that provide health, welfare, or other social services may also comply with §84.22 by delivering services at alternate accessible sites or making home visits. Thus, for example, a pharmacist might arrange to make home deliveries of drugs.

(c) *Small health, welfare, or other social service providers.* If a recipient with fewer than fifteen employees that provides health, welfare, or other social services finds, after consultation with a handicapped person seeking its services, that there is no method of complying with §84.22(a) other than making a significant alteration in its existing facilities, the recipient may, as an alternative, refer the handicapped person to other providers of those services that are accessible.

Analysis: *Under revised §84.22(c), small providers of health, welfare, and social services (those with fewer than fifteen employees) may refer a beneficiary to an accessible provider of the desired service, but only if no means of meeting the program accessibility requirement other than a significant alteration in existing facilities is available. The referring recipient has the responsibility of determining that the other provider is in fact accessible and willing to provide the service. The Secretary believes this "last resort" referral provision is appropriate to avoid imposition of additional costs in the health care area, to encourage providers to remain in the Medicaid program, and to avoid imposing significant costs on small, low-budget providers such as day-care centers or foster homes.*

84

A recent change in the tax law may assist some recipients in meeting their obligations under this section. Under section 2122 of the Tax Reform Act of 1976, recipients that pay federal income tax are eligible to claim a tax deduction of up to $25,000 for architectural and transportation modifications made to improve accessibility for handicapped persons. Many physicians and dentists, among others, may be eligible for this tax deduction. See 42FR 17870 (April 4, 1977), adopting 26 CFR 7.190.

Several commenters expressed concern about the feasibility of compliance with the program accessibility standard. The Secretary believes that the standard is flexible enough to permit recipients to devise ways to make their programs accessible short of extremely expensive or impractical physical changes in facilities. Accordingly, the section does not allow for waivers. The Department is ready at all times to provide technical assistance to recipients in meeting their program accessibility responsibilities. For this purpose, the Department is establishing a special technical assistance unit. Recipients are encouraged to call upon the unit staff for advice and guidance both on structural modifications and on other ways of meeting the program accessibility requirement.

(d) *Time period.* A recipient shall comply with the requirement of §84.22(a) within sixty days of the effective date of this part except that where structural changes in facilities are necessary, such changes shall be made within three years of the effective date of this part, but in any event as expeditiously as possible.

Analysis: *Paragraph (d) has been amended to require recipients to make all nonstructural adjustments necessary for meeting the program accessibility standard within sixty days. Only where structural changes in facilities are necessary will a recipient be permitted up to three years to accomplish program accessibility. It should be emphasized that the three-year time period is not a waiting period and that all changes must be accomplished as expeditiously as possible. Further, it is the Department's belief, after consultation with experts in the field, that outside ramps to buildings can be constructed quickly and at relatively low cost. Therefore, it will be expected that such structural additions will be made promptly to comply with §84.22(d).*

The regulation continues to provide, as did the proposed version, that a recipient planning to achieve program accessibility by making structural changes must develop a transition plan for such changes within six months of the effective date of the regulation. A number of commenters suggested extending that period to one year. The Secretary believes that such an extension is unnecessary and unwise. Planning for any necessary structural changes should be undertaken promptly to ensure that they can be completed within the three-year period. The elements of the transition plan as required by the regulation remain virtually unchanged from the proposal but §84.22(d) now includes a requirement that the recipient make the plan available for public inspection.

Several commenters expressed concern that the program accessibility standard would result in the segregation of handicapped persons in educational institutions. The regulation will not be applied to permit such a result. See §84.4(c)(2)(iv), prohibiting unnecessarily separate treatment; §84.35, requiring that students in elementary and secondary schools be educated in the most integrated setting appropriate to their needs; and new §84.43(d), applying the same standard to postsecondary education.

We have received some comments from organizations of handicapped persons on the subject of requiring, over an extended period of time, a barrier-free environment – that is, requiring the removal of all architectural barriers in existing facilities. The Department has considered these comments but has decided to take no further action at this time concerning these suggestions, believing that such action should only be considered in light of experience in implementing the program accessibility standard.

POLICY INTERPRETATIONS CONCERNING 84.22
Federal Register Monday, August 14, 1978, Part II.

No. 3: "Program Accessibility" Requirements

Policy Interpretation: A recipient is not required to make structural modifications to its existing facilities if its services can be made effectively available to mobility impaired persons by other methods. In selecting from among other methods, recipients must give priority to those that offer handicapped and nonhandicapped persons programs and activities in the same setting. Because of the administrative impossibility of continually determining, on an up-to-date basis, whether mobility impaired individuals will be entitled to services by a given recipient, and for other reasons set forth below, the absence of mobility impaired persons residing in an area cannot be used as the test of whether programs and activities must be made accessible.

Discussion: *The Department has been asked by recipients conducting modest programs (e.g., libraries in rural areas, small welfare offices, day care centers and senior citizens centers): (1) Whether they must make structural changes to their buildings to accommodate persons who are mobility impaired; and (2) whether they must make their services accessible to mobility impaired persons even if no such persons are known to live in their service area.*

The Section 504 regulation was carefully written to require "program accessibility" not "building accessibility," thus allowing recipients flexibility in selecting the means of compliance. For example, they may arrange for the delivery of their services at alternative sites that are accessible or use aides or deliver services to persons at their homes. The regulation does not require that all existing facilities or every part of an existing facility be made accessible; structural changes are not necessary if other methods are effective in making the recipient's services available to mobility impaired persons. For example, a library

building in a rural area with one room and an entrance with several steps can make its services accessible in several ways. It may construct a simple wooden ramp quickly and at relatively low cost. Mobility impaired persons may be provided access to the library's services through a bookmobile or by special messenger service or clerical aid or any other method that makes the resources of the library "readily accessible." However, recipients are required to give priority to methods that offer handicapped and nonhandicapped persons programs and activities in the same setting.

There is an additional option for recipients that have fewer than 15 employees and that provide health, welfare, or other social services. If such a recipient finds, after consulting with a handicapped person seeking services, that only a significant alteration to its existing facilities will make its program accessible, the recipient may refer the handicapped person to another provider of the same services that is accessible. The referring recipient has the obligation to determine that the other provider is accessible and is willing to provide the services.

The Section 504 regulation does not condition the requirement of "program accessibility" upon handicapped persons residing in the recipient's service area. Such a condition would be administratively unworkable. It would require the establishment of arbitrary geographic boundaries for each recipient's service area, the identification of all handicapped persons in that area and periodic surveys to determine whether handicapped persons have moved into or out of the service area. It would also ignore the needs of those persons who temporarily become mobility impaired or those mobility impaired persons who visit a service area. Moreover, mobility impaired persons may decide not to settle in a community because its services are not accessible.

The Department concludes, as it did when the Section 504 regulation was adopted, that because the "standard (for program accessibility) is flexible" the regulation "does not allow for waivers."

No. 4: Carrying Handicapped Persons to Achieve Program Accessibility

Policy Interpretation: Carrying is an unacceptable method for achieving program accessibility for mobility impaired persons except in two cases. First, when program accessibility can be achieved only through structural changes, carrying may serve as an expedient until construction is completed. Second, carrying will be permitted in manifestly exceptional cases if carriers are formally instructed on the safest and least humiliating means of carrying and the service is provided in a reliable manner.

Discussion: *The Section 504 regulation requires that federally assisted programs and activities be "readily accessible" to handicapped persons. A program or activity will be judged "readily accessible" only if it is conducted in a building and room that mobility impaired persons can enter and leave without assistance from others. Carrying requires such assistance and is therefore unacceptable.*

Carrying may also be undependable (e.g., when college students or employees are expected to volunteer) and often hazardous (e.g., when carriers are untrained or when the carrying is to occur on poorly illuminated or narrow stairs). It may humiliate the handicapped person by dramatizing his or her dependency and creating a spectacle. Its use is therefore inconsistent with Section 504's critical objective of encouraging handicapped persons to participate in programs and activities.

The Department recognizes that carrying may be necessary in the following cases:

(1) The Section 504 regulation requires "program accessibility" for handicapped persons and suggests a variety of methods for attaining compliance that can be implemented within 60 days. However, if "program accessibility" can be achieved only through "alterations of existing facilities (or) construction of new facilities," the construction must be completed "as expeditiously as possible," but in no event, later than June 3, 1980. Although recipients are not required to provide "program accessibility" during the period of construction, the Department encourages recipients to develop an interim expedient that may be carrying.

(2) Carrying is also acceptable in manifestly exceptional cases. For example, a university has properly maintained that the structural changes and devices necessary to adapt its oceanographic vessel for use by mobility impaired persons are prohibitively expensive or unavailable. Carrying, under this exception, must be provided in a manner that attempts to overcome its shortcomings. For example, carriers must be formally instructed on the safest and least humiliating means of carrying and the service must be provided in a reliable manner.

(e) *Transition Plan.* In the event that structural changes to facilities are necessary to meet the requirement of paragraph (a) of this section, a recipient shall develop, within six months of the effective date of this part, a transition plan setting forth the steps necessary to complete such changes. The plan shall be developed with the assistance of interested persons, including handicapped persons or organizations representing handicapped persons. A copy of the transition plan shall be made available for public inspection. The plan shall, at a minimum:
(1) Identify physical obstacles in the recipient's facilities that limit the accessibility of its program or activity to handicapped persons;
(2) Describe in detail the methods that will be used to make the facilities accessible;
(3) Specify the schedule for taking the steps necessary to achieve full program accessibility and, if the time period of the transition plan is longer than one year, identify steps that will be taken during each year of the transition period; and
(4) Indicate the person responsible for implementation of the plan.
(f) *Notice.* The recipient shall adopt and implement procedures to ensure that interested persons, including persons with impaired vision or hearing, can obtain information as to the existence and location of services, activities, and facilities that are accessible to and usable by handicapped persons.

§84.23 NEW CONSTRUCTION

(a) *Design and construction.* Each facility or part of a facility constructed by, on behalf of, or for the use of a recipient shall be designed and constructed in such manner that the facility or part of the facility is readily accessible to and usable by handicapped persons, if the construction was commenced after the effective date of this part.

Analysis: 23. New construction: *Section 84.23 requires that all new facilities, as well as alterations that could affect access to and use of existing facilities, be designed and constructed in a manner, so as to make the facility accessible to and usable by handicapped persons. Section 84.23(a) has been amended so that it applies to each newly constructed facility if the construction was commenced after the effective date of the regulation. The*

words "if construction has commenced" will be considered to mean "if ground-breaking has taken place." Thus, a recipient will not be required to alter the design of a facility that has progressed beyond groundbreaking prior to the effective date of the regulation.

(b) *Alteration.* Each facility or part of a facility which is altered by, on behalf of, or for the use of a recipient after the effective date of this part in a manner that affects or could affect the usability of the facility or part of the facility shall, to the maximum extent feasible, be altered in such manner that the altered portion of the facility is readily accessible to and usable by handicapped persons.

Analysis: *Paragraph (b) requires certain alterations to conform to the requirement of physical accessibility in paragraph (a). If an alteration is undertaken to a portion of a building the accessibility of which could be improved by the manner in which the alteration is carried out, the alteration must be made in that manner. Thus, if a doorway or wall is being altered, the door or other wall opening must be made wide enough to accommodate wheelchairs. On the other hand, if the alteration consists of altering ceilings, the provisions of this section are not applicable because this alteration cannot be done in a way that affects the accessibility of that portion of the building. The phrase "to the maximum extent feasible" has been added to allow for the occasional case in which the nature of an existing facility is such as to make it impractical or prohibitively expensive to renovate the building in a manner that results in its being entirely barrier-free. In all such cases, however, the alteration should provide the maximum amount of physical accessibility feasible.*

(c) *American National Standards Institute Accessibility Standards.* Design, construction, or alteration of facilities in conformance with the "American National Standard Specifications for Making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped," published by the American National Standards Institute, Inc. (ANSI), shall constitute compliance with paragraphs (a) and (b) of this section. Departures from particular requirements of those standards by the use of other methods shall be permitted when it is clearly evident that equivalent access to the facility or part of the facility is thereby provided.

§84.24-30 (RESERVED)

Analysis: *As proposed, §84.23(c) required compliance with the American National Standards Institute (ANSI) standard on building accessibility as the minimum necessary for compliance with the accessibility requirement of §84.23(a) and (b). The reference to the ANSI standard created some ambiguity, since the standard itself provides for waivers where other methods are equally effective in providing accessibility to the facility. Moreover, the Secretary does not wish to discourage innovation in barrier-free construction by requiring absolute adherence to a rigid design standard. Accordingly, §84.23(c) has been revised to permit departures from particular requirements of the ANSI standard where the recipient can demonstrate that equivalent access to the facility is provided.*

Section 84.23(d) of the proposed regulation, providing for a limited deferral of action concerning facilities that are subject to Section 502 as well as Section 504 of the Act, has been deleted. The Secretary believes that the provision is unnecessary and inappropriate to this regulation. The Department will, however, seek to coordinate enforcement activities under this regulation with those of the Architectural and Transportation Barriers Compliance Board.

APPENDIX D

Campuses Reporting Accessibility Projects in Older Buildings

The editorial and project management staff of *Adapting Historic Campus Structures for Accessibility* extend their deep appreciation to the following persons and institutions that reported on accessibility projects in older buildings. Anyone wanting more information about any school's particular solution to a problem is urged to contact a representative of that institution.

The staff also wants to thank all other persons who responded to requests for information but who were unable to report on specific accessibility projects their campuses have planned and/or implemented in older buildings.

THE UNIVERSITY OF ALBERTA
G. A. Bulat
Director of Physical Plant
Department of Physical Plant
Edmonton, Alberta, Canada T6G 2E1

ALBION COLLEGE
R. P. Koehs, Sr.
Physical Plant Director
Albion, Michigan 49224

THE UNIVERSITY OF ARIZONA
Victor E. Robeson
Director
Division of Physical Resources
Building 49
Tucson, Arizona 85721
(602) 884-1611

BOWLING GREEN STATE UNIVERSITY
Jan Scott Bey
Director, Handicapped Services
Bowling Green, Ohio 43403
(419) 372-0495

CALIFORNIA COLLEGE OF ARTS AND CRAFTS
Douglas C. Dougan
Business Manager
Broadway at College
Oakland, California 94618
(415) 653-8118

CALIFORNIA STATE UNIVERSITY, FULLERTON
Richard Stewart
Facility Planning
Fullerton, California 92634
(714) 773-2122

UNIVERSITY OF CALIFORNIA, IRVINE
Eugene F. Harrie
Principal Architect
Facilities Management
Irvine, California 92717

THE COLORADO COLLEGE
Kathleen R. Peterson
Director
Public Information Office
Colorado Springs, Colorado 80903

UNIVERSITY OF COLORADO AT BOULDER
Sandra Johnson
Office of Facilities Development
Stadium 260—Campus Box 376
Boulder, Colorado 80309
(303) 492-7985

CORNELL UNIVERSITY
Barbara Goren
Architect, Design and Project Management
Humphries Service Building
Ithaca, New York 14853
(607) 256-4822

DALHOUSIE UNIVERSITY
Gina Wilkins
Information/Public Relations Officer
Halifax, Nova Scotia, Canada B3H 3J5
(902) 424-2517

UNIVERSITY OF DELAWARE
Robert M. Lamison, AIA
University Architect
Engineering & Construction Department
Newark, Delaware 19711
(302) 738-2601

FAYETTEVILLE STATE UNIVERSITY
Arthur J. Pindle, Jr.
Director
Institutional Research
Fayetteville, North Carolina 28301

FINDLAY COLLEGE
John C. Hutson
Director of Alumni Affairs
1000 North Main Street
Findlay, Ohio 45840
(419) 422-8313

FRANKLIN AND MARSHALL COLLEGE
Clayton C. Bierman
Director of Construction
Lancaster, Pennsylvania 17604

GALLAUDET COLLEGE
Thomas A. Lillis
Central Utilities Building, 3rd Floor
Washington, D.C. 20002
(202) 651-5000

UNIVERSITY OF HAWAII AT MANOA
Philip K. C. Wong
Handicapped Accessibility Coordinator
Office of Facilities Management
Physical Plant Building
2002 East-West Road
Honolulu, Hawaii 96822

HEIDELBERG COLLEGE
Helen Reynolds
Dean of Institutional Research
Tiffin, Ohio 44883
(419) 448-2000

HOUSTON COMMUNITY COLLEGE SYSTEM
B. L. Ditto
Vice President, Administration
22 Waugh Drive
Houston, Texas 77007
(713) 869-5021

UNIVERSITY OF IDAHO
Edward C. Stohs
Director of Physical Plant
Physical Plant Division
Moscow, Idaho 83843

INDIANA UNIVERSITY OF PENNSYLVANIA
Judith A. Moorhead
Executive Director
Office of Public Affairs
316 John Sutton Hall
Indiana, Pennsylvania 15705
(412) 357-2232

IONA COLLEGE
John McFadden
Director of Facilities Management
New Rochelle, New York 10801

THE UNIVERSITY OF KANSAS
Allen L. Wiechert, AIA
University Director
Facilities Planning
223 Strong Hall
Lawrence, Kansas 66045
(913) 864-3175

KNOX COLLEGE
Joseph G. Vacek
Director of Physical Plant
Galesburg, Illinois 61401
(309) 343-0112

LANSING COMMUNITY COLLEGE
Douglas D. McKinstry
Director, Physical Plant Department
419 N. Capitol Avenue
Box 40010
Lansing, Michigan 48901

LOYOLA COLLEGE
George T. Causey
Director, Physical Plant
Francis M. Minakowski
Director, Public Relations
Evergreen Campus
4501 North Charles Street
Baltimore, Maryland 21210

LYNCHBURG COLLEGE
Kirk Murphy
Assistant Director, Plant Facilities
Lynchburg, Virginia 24501
(804) 845-9071

MEMPHIS STATE UNIVERSITY
Bergen S. Merrill, Jr.
Director
Physical Plant and Planning
Memphis, Tennessee 38152
(901) 454-2075

MICHIGAN STATE UNIVERSITY
Donald L. Freed, AIA
Architect for Physical Plant
Physical Plant Division
East Lansing, Michigan 48824

MIDDLESEX COUNTY COLLEGE
Joseph Lalli
College Engineer
Edison, New Jersey 08817

MILLS COLLEGE
Eugene E. Phillips
Physical Plant Manager
Oakland, California 94613

THE UNIVERSITY OF MISSISSIPPI
H. R. Mitchell, Jr., AIA
University Architect
Physical Plant Department
University, Mississippi 38677

UNIVERSITY OF MISSOURI-KANSAS CITY
Bob O. Obenland
Director, Physical Plant
Room 101-General Services Building
1011 East 51st Street
Kansas City, Missouri 64110
(816) 276-1354

MONTANA COLLEGE OF MINERAL SCIENCE AND TECHNOLOGY
Fred W. DeMoney
President
Butte, Montana 59701
(406) 792-8321

MOREHOUSE COLLEGE
Robert J. Leonard
Director of Development
Atlanta, Georgia 30314
(404) 681-2800

UNIVERSITY SYSTEM OF NEW HAMPSHIRE
Vincent E. Todd
Director, Physical Plant Development & Utilization
Lee Center
Durham, New Hampshire 03824

THE UNIVERSITY OF NORTH CAROLINA AT GREENSBORO
H. Mark Altvater
University Engineer
Department of Physical Plant
Greensboro, North Carolina 27412

UNIVERSITY OF NORTHERN IOWA
Donald A. Kelly
Director, Public Information Services
Cedar Falls, Iowa 50613
(319) 273-2761

NORTHLAND COLLEGE
Harvey B. Haukaas
Director, Environmental Services
Ashland, Wisconsin 54806
(715) 682-4531

THE PENNSYLVANIA STATE UNIVERSITY
A. R. Bigatel
Director, Design and Engineering
Office of Physical Plant
401 Old Main Building
University Park, Pennsylvania 16802
(814) 865-7605

PLYMOUTH STATE COLLEGE
Vincent E. Todd
Director, Physical Plant Development Utilization
University of New Hampshire
Plymouth, New Hampshire 03264
(414) 425-0220

REED COLLEGE
Robert S. Parker
Director, Administrative Services
Portland, Oregon 97202

SIOUX FALLS COLLEGE
W. Norman Haupt
Vice President
Sioux Falls, South Dakota 57101
(605) 336-2850

SOUTH DAKOTA STATE UNIVERSITY
Richard Waldner
Administrative Assistant
Physical Plant Department
Administration 304
Brookings, South Dakota 57006
(605) 688-4136

SOUTHWESTERN AT MEMPHIS
Thomas R. Keppie, Jr.
Director of Administrative Services
2200 North Parkway
Memphis, Tennessee 38112
(901) 274-1800

SOUTHWESTERN UNIVERSITY
Kirk Treible
Vice President for Fiscal Affairs
Georgetown, Texas 78626
(512) 863-6511

ST. CLOUD STATE UNIVERSITY
Jack R. Jones
University 504 Coordinator
Room A133, Education Building
St. Cloud, Minnesota 56301
(612) 255-3196

SYRACUSE UNIVERSITY
Richard Wilson
Director, News Bureau
105 Administration Building
Syracuse, New York 13210
(315) 423-3784

THE UNIVERSITY OF TENNESSEE
John C. Parker
Director, Physical Plant Department
2233 Volunteer Boulevard
Knoxville, Tennessee 37916
(615) 974-2175

THE UNIVERSITY OF TEXAS AT AUSTIN
Homer T. Ward
Director of Physical Plant
P.O. Drawer 7580, University Station
Austin, Texas 78712
(512) 471-7403

TRINITY COLLEGE
Barbara A. Wicker
Coordinator, Affirmative Action Program
Burlington, Vermont 05401

TUSKEGEE INSTITUTE
Booker Conley
Architectural Planner
Tuskegee, Alabama 36088

WEST VIRGINIA UNIVERSITY
Harry W. Ernst
Director, Public Affairs
Office of University Relations
Communications Building
Morgantown, West Virginia 26506
(304) 293-6366

THE UNIVERSITY OF WISCONSIN
Gordon D. Orr, Jr., FAIA
Campus Architect
John A. Paulson
Staff Architect
610 N. Walnut Street
Madison, Wisconsin 53706
(608) 263-3000

UNIVERSITY OF WISCONSIN-OSHKOSH
Donald R. Wolter
Executive Director
Facilities Management
Oshkosh, Wisconsin 54901
(414) 424-0220

Bibliography

A selection of publications on the topic of making historic buildings accessible to handicapped people:

Journal Articles

"Access to History." *Historic Preservation* 30 (July-September 1978): 3.

Kenney, Alice P. "Open Door for the Handicapped." *Historic Preservation* 30 (July-September 1978): 12-17.

Reports

Kenney, Alice P. *Hospitable Heritage, the Report of Museum Access*. Allentown, Pennsylvania: Museum Access Project, Cedarcrest College, [1979].

National Trust for Historic Preservation. *Handicapped Access and Historic Preservation* (memorandum). Washington, D.C.: National Trust for Historic Preservation, [July 1978].

Pollock, Karen S. *Arts and the Handicapped, Information Sheet #41*. Manlius, New York: Regional Conference of Historical Agencies, [April 1978].

Parrott, Charles. *Access for the Disabled in Historic Buildings*. Washington, D.C.: Technical Preservation Services Division, Heritage Conservation and Recreation Service, U.S. Department of the Interior, [1980].

Other references used in preparation of this book:

Magazine Articles

"Building Codes for Historic and Older Structures: the Massachusetts Approach to Developing Realistic Standards." *Technology and Conservation*, Summer 1978, pp. 26-28.

Dixon, John Morris. "Accessible and Perceivable." *Progressive Architecture*, April 1978, p. 6.

Jones, Michael A. and Catlin, John H. "Design for Access." *Progressive Architecture*, April 1978, pp. 65-70.

Knight, Carleton III. "Energy: Preservation is most efficient, study proves." *Preservation News*, June 1979, p. 1.

Books

Coons, Maggie, and Milner, Margaret, editors. *Creating an Accessible Campus*. Washington, D.C.: Association of Physical Plant Administrators of Universities and Colleges, 1978.

Fawcett, Jane, editor. *The Future of the Past: Attitudes to Conservation 1174-1974*. New York: Whitney Library of Design, 1976.

Harvey, John H. *Conservation of Buildings*. London: John Baker, 1972.

Mace, Ronald L. *Accessibility Modifications, Guidelines for Modifications to Existing Buildings for Accessibility to the Handicapped*. Raleigh, North Carolina: North Carolina Department of Insurance, 1976.

Milner, Margaret. *Opening Doors, A Handbook on Making Facilities Accessible to Handicapped People*. Washington, D.C.: National Center for a Barrier Free Environment and Community Services Administration, 1978.

Miner, Ralph W. *Conservation of Historic and Cultural Resources*. Chicago: American Society of Planning Officials, 1969.

National Trust for Historic Preservation. *Economic Benefits of Preserving Old Buildings*. Washington, D.C.: Preservation Press, 1976.

Ohio Governor's Committee on Employment of the Handicapped and Schooley Cornelius Associates. *Access for All, An Illustrated Handbook Of Barrier Free Design for Ohio*. Columbus, Ohio: 1977.

Wrenn, Tony P., and Mulloy, Elizabeth D. *America's Forgotten Architecture*. New York: Pantheon Books, 1976.

Reports

Beckwith, James P., Jr. *Significant State Historic Preservation Statutes, Information Sheet #21*. Washington, D.C.: National Trust for Historic Preservation, [1979].

U.S. Department of Housing and Urban Development and U.S. Department of Interior. *Guidelines for Rehabilitating Old Buildings: Principles to Consider When Planning Rehabilitation and New Construction Projects in Older Neighborhoods*. Washington, D.C.: U.S. Government Printing Office, [1977].

Standards and Codes

American National Standards Institute. *ANSI A117.1, Specifications for Making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped*. New York: American National Standards Institute [1961 (r1971) and 1980].

Jones, Michael A. *Accessiblity Standards Illustrated*. Springfield, Illinois: Illinois Capital Development Board [1978].

Morton, W. Brown II, and Hume, Gary L. *Secretary of the Interior's Standards for Historic Preservation Projects with Guidelines for Applying the Standards*. Washington, D.C.: Technical Preservation Services Division, Heritage Conservation and Recreation Service, U.S. Department of the Interior [1979].

Office of Archeology and Historic Preservation. *Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings*. Washington, D.C.: Heritage Conservation and Recreation Service, U.S. Department of the Interior [1979].

State of California. *State Historical Building Code*. Sacramento, California: State of California [1979].

Index

Access Systems 7, 15
Accessibility Requirements, Minimum 7
Adaptive Use 5, 31
Advisory Council on Historic Preservation 11, 36
Advisory Council on Historic Preservation Procedures for Protection of Historic and Cultural Properties 9, 12
Advisory Council on Historic Preservation Supplementary Guidance: Handicapped Access to Historic Properties 12
American Institute of Architects 8
American National Standards Institute (ANSI) A117.1 7, 10, 11
Antiquities Act of 1906 9, 12
Architectural Barriers Act of 1968 10, 12
Architectural Barriers, Typical 13-14, 34-35
Bridges 22, 23, 27, 31
Building Links 25, 27
California/Berkeley, University of, Design Study 34, 54-60
California State Historical Code 11, 51
Clemson University Design Study 34, 37-44
College Housing Loan Program 10
Colorado, University of 34, 61-66
Conservation (Definition) 4
Cost-saving Strategies 30
Courtyards 54-55, 57, 59, 68, 73, 74, 75
Department of Health, Education and Welfare, Section 504 Regulations 2, 10, 12
Disabilities, Functional Listing of 6
Doors 20, 21, 51, 52, 53, 64, 68
Drinking Fountains 27, 28, 39, 48, 49, 52, 53, 58, 65, 72
Earth Berms 19, 21
Education for All Handicapped Children Act 2
Elevators 23-25, 26, 31, 38, 47, 49, 52, 56, 58, 63, 71, 72
Entrances 7, 16-23, 35-36, 38, 46, 47, 48, 51, 52, 56, 57, 61, 63, 68, 71, 72
Entry Foyers, 22, 47, 48
Executive Order 11593, Protection and Enhancement of the Cultural Environment 9, 12
Executive Order 11914, Nondiscrimination in Federally Assisted Programs 12
Grading 18, 19, 20
Hazards to Visually Impaired Persons 35, 58, 59, 66
Higher Education Facilities Act 10
Historic Preservation Officers, State 11, 78-79
Historic Sites Act of 1935 9, 12
Horizontal Circulation 39, 47, 52, 58, 63, 72, 73
Housing 7, 27-29
Interior Department Standards for Historic Preservation Projects 5, 9, 12
Interior Level Changes 14, 23, 34-35, 39, 56, 58
Iowa State University Design Study 34, 45-49
Kansas State University Design Study 34, 50-53
Landscaping 15, 16, 19-20, 21, 51, 69, 74
Legislation Governing Preservation and Access, Federal 12
Life Safety 48
Locker Rooms 39, 41, 43
Music Halls 71, 72
National Historic Preservation Act of 1966 9, 11, 12
National Register of Historic Places 26, 30
National Trust for Historic Preservation 8, 11
National Trust for Historic Preservation, Act Creating 9, 12
Notre Dame, University of, Design Study 34, 67-75
Parking 7, 15, 38, 47, 50, 51, 57, 61, 63
Passenger Drop-Off Zones 15, 39
Physical Education Facilities 37-44
Preservation (Definition) 5
Preservation Standards 7
Preservation of Historic and Archaeological Data Act of 1974 9, 12
Public Buildings Cooperative Use Act 12
Public Telephones 58
Ramps 16, 17, 18, 19, 22, 23, 29, 39, 40, 42, 47, 56, 57, 58, 59, 60, 63, 64, 66, 74
Rehabilitation Act of 1973 and 1974 Amendments iii, 2, 10, 12
Rehabilitation of Buildings 5
Restoration (Definition) 5
Reversability, Concept of 8, 16
Section 504 of the Rehabilitation Act of 1973 iii, 2, 10, 12
Section 504 of the Rehabilitation Act of 1973, Department of Health, Education and Welfare Regulations Implementing iii, 2, 10, 12
Site Access 7, 15, 38, 46, 49, 50, 51, 55, 56-57, 61, 63, 64, 68-72
Sound Amplification Systems 66
Special Spaces 39, 48, 52, 58, 66, 72, 74
Spectator Seating 42, 48, 65, 66, 72
State Building Codes Covering Historic Structures 11
Student Unions 7, 67-75
Swing-Clear Hinges 52
Tax Reform Act of 1976 9, 12
Terraces 69-72, 74, 75
Theatres 7, 68
Threshold Modifications 52, 73
Toilet Rooms 7, 27, 28, 39, 47, 48, 52, 58, 59, 62, 64, 65, 66, 71, 72, 73, 74
Vertical Access 7, 23, 38, 47, 51, 58, 63, 72
Visual Alarm Systems 29
Walkways 15, 18, 19, 51, 61
Wheelchair Lifts 17, 19, 23, 39, 40, 42, 56, 60
Windows Converted to Doors 23, 57, 60